GRANULAR AGGREGATE RESOURCES,

ST. GEORGE (NTS 21 G/2) MAP AREA, NEW BRUNSWICK

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Minerals and Energy Division

Department of Natural Resources and Energy

New Brunswick

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ABSTRACT

The St. George map area contains an estimated 428 million m^3 of workable granular aggregate materials. Approximately 45% of this material lies in the extensive outwash delta deposits along the Pocologan and New rivers. A further 40% is concentrated in the extensive outwash delta and ice-contact deposits of the Utopia Centre-Pennfield Ridge glaciofluvial complex. Further potential reserves in excess of 100 million m^3 lie below the water table in the above deposits. The remainder of the reserves are found in ice-contact, outwash, and shallow-water marine deposits, many of significant size, well dispersed throughout the map area.

The materials are predominantly of good quality. An abundance of both fine and coarse aggregate, suitable for a wide variety of uses, is present.

RÉSUMÉ

On estime qu'il y a, dans la région illustrée sur la carte de St. George, 428 millions m^3 d'agrégats granulaires exploitables. Environ 45% de ces agrégats se trouvent dans la vaste zone de dépôts deltaïques fluvio-glaciaires le long de la Pocologan et de la rivière New. Un autre 40% est concentré dans la vaste zone de dépôts deltaïques fluvio-glaciaires et de dépôts glaciaires du complexe fluvio-glaciaire Utopia Centre-Pennfield Ridge. D'autres réserves potentielles de plus de 100 millions de mètres cubes se trouvent sous la nappe phréatique des gisements susmentionnés. Le reste des réserves se trouve dans les dépôts glaciaires, les dépôts fluvio-glaciaires et les dépôts marins peu profonds, plusieurs d'importantes dimensions, répartis dans l'ensemble de la région illustrée sur la carte.

Ces matériaux sont en général de bonne qualité. On est en effet en présence d'une grande quantité d'agrégats à grains fins ou à gros grains qui conviennent à une multitude d'utilisations.

INTRODUCTION

LOCATION AND ACCESS

The St. George (21 G/2) map area is located in southwestern New Brunswick, along the Bay of Fundy coast, approximately midway between Saint John and St. Stephen (Figure 1). It comprises a total land area of about 660 km^2, lying between longitudes 66°30'W and 67°00'W, and latitude 45°15'N and the Bay of Fundy and Passamaquoddy Bay (to the south and southwest, respectively) (Figure 2). St. George is the major community within the area.

The area is traversed from west to east by Provincial Highway 1. A number of interconnecting Provincial highways and a network of local roads and logging roads provide good access throughout most of the area. Access to most of the major granular aggregate deposits is good to excellent.

PREVIOUS WORK IN THE AREA

Aspects of the surficial geology of the St. George area were described by Mathew (1879) and Chalmers (1885, 1890) in their early works on the surficial geology of southern New Brunswick. The surficial geology of the area has since been mapped at the regional scale (1:250 000) by Gadd (1973). In addition, the coastal 1 to 2 km flanking the Bay of Fundy has been mapped by Hunter and Associates (1982). The soils of the area, with associated information on surficial geology, were described by Wicklund and Langmaid (1953). The results of the above studies have been compiled and summarized by Rampton et al. (1984).

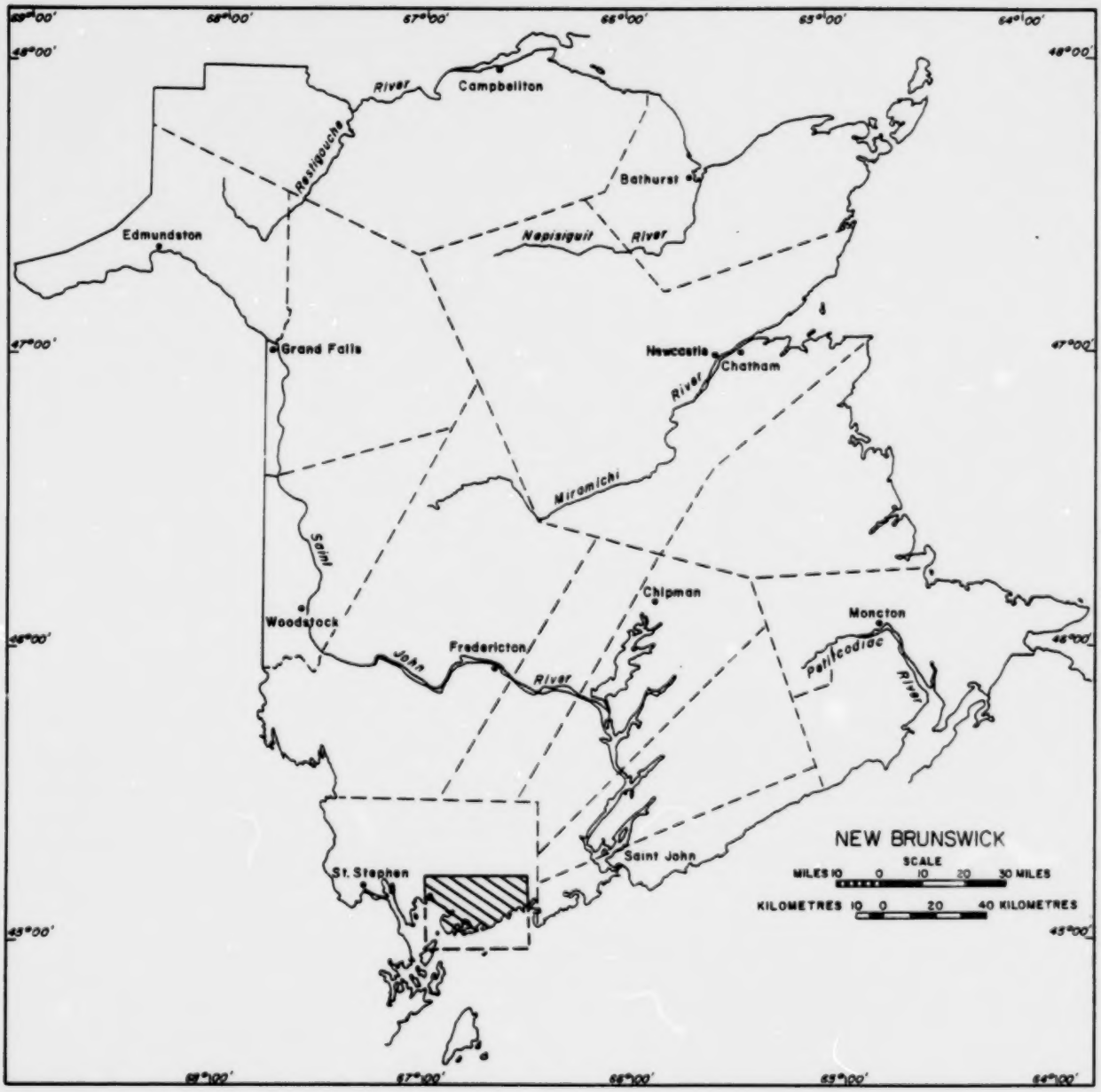

FIGURE 1. Location of the St. George map area (21 G/2).

Information on some aggregate extraction sites in the study area is provided by Hamilton and Carroll (1975) in their preliminary survey of the sand and gravel resources of the province.

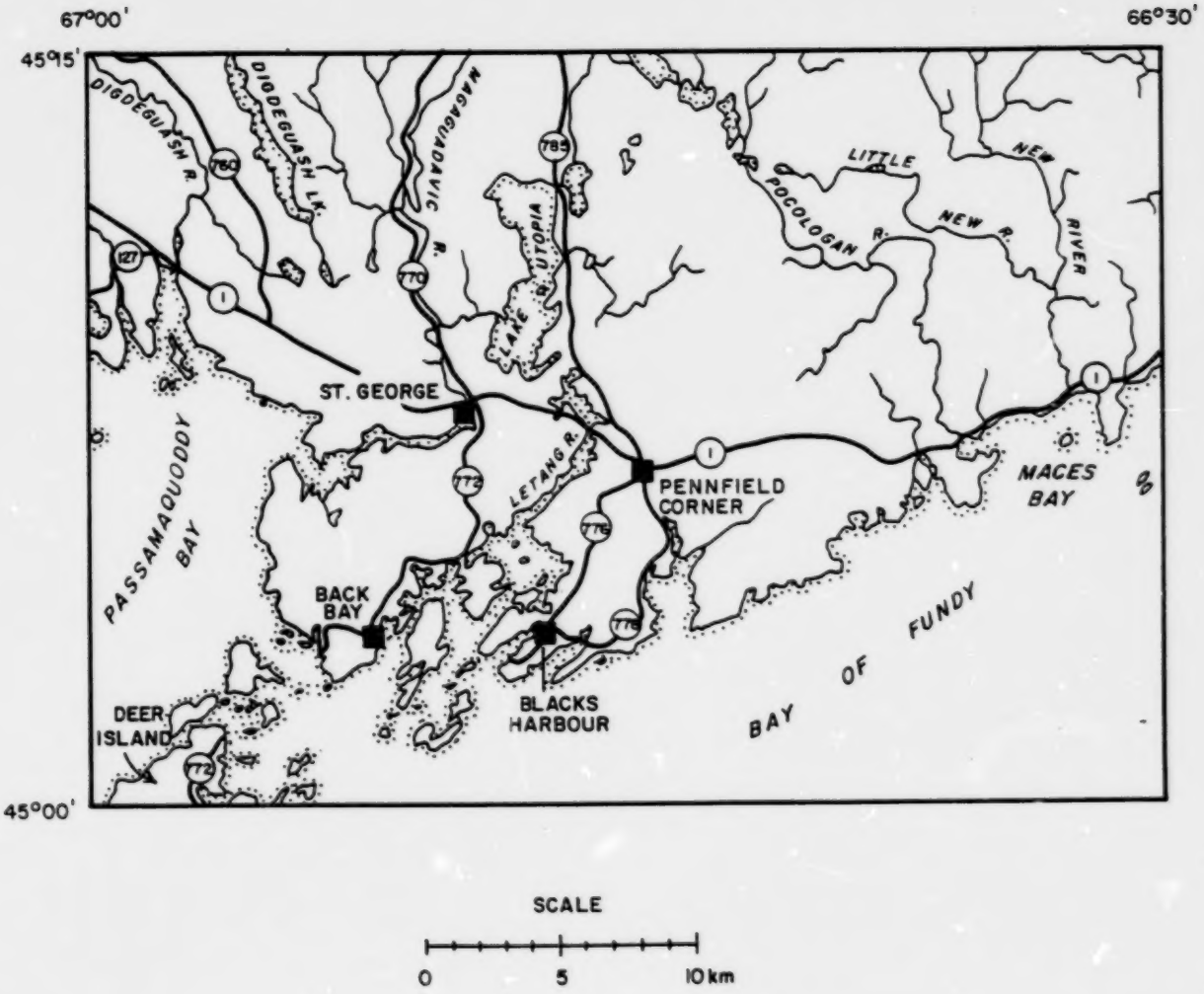

FIGURE 2. Detailed location map of the St. George map area (21 G/2).

ADI Limited (1974) and the International Passamaquoddy Engineering Board (1959) provide detailed information on some of the aggregate deposits in the study area. Hammer seismic surveys of several of the major granular aggregate deposits in the area were conducted by Chandra (1976) and Gagné (1969).

The first detailed bedrock geology map of the area was prepared by Alcock and Perry (1960), who also commented on a few aspects of the surficial geology of the area.

THE PRESENT STUDY

This report summarizes the results of field work undertaken by P.F. Finamore during the summer of 1975, and by A.A. Seaman during two weeks in the summer of 1986. The eastern and southwestern parts of the area, exclusive of Deer Island, were mapped by Finamore. Deer Island and the northwestern part of the area were mapped by Seaman. The boundary line separating the mainland mapping area of each author is depicted on the accompanying map (Plate 87-3).

The objective of this study was to provide basic information pertaining to the location, extent, thickness, and quality characteristics of the granular aggregate deposits in the St. George map area. Field work involved the examination of both man-made and natural exposures. All known aggregate extraction sites were examined and described, and samples for textural and lithologic analysis were obtained from representative sites. In addition, hammer seismic surveys were carried out on the Utopia Centre, Pennfield, and Pocologan River deposits.

Finamore's work was previously published in a report that included an aggregate inventory of part of the McDougall Lake (21 G/7) map area, to the north (Finamore 1977). The granular aggregate inventory of the McDougall Lake map area has since been completed by Thibault (1983). The current report is a

revision, by Seaman, of the parts of the previous report pertaining to the St. George area. It includes most of the details presented in the earlier report, plus new information for the northwestern part of the St. George area. Time did not permit a re-evaluation of the aggregate resources in the area mapped by Finamore. Consequently, the information on this area is only current to 1975; only the information in the area mapped by Seaman is current to 1986. Similarly, the accompanying map is a redrafting of Finamore's map onto a new topographic base, combined with the additional aggregate resource information collected by Seaman.

Because the two authors used different descriptive techniques, their detailed site descriptions are recorded in separate appendices (A: Seaman; B: Finamore). To improve the clarity of the report and map, Finamore's sites have been renumbered to fit into a general west to east, north to south, pattern. For cross-reference, in the appendices the original number is recorded in parentheses after the new number. Finamore's major, or otherwise significant, site descriptions have been metricated, and revised using his original field notes for reference. Any additional comments or observations made by Seaman pertaining to these sites have been added parenthetically. The remainder of Finamore's site descriptions have been rewritten as supplementary observations, recorded in Appendix C along with those of Seaman.

ACKNOWLEDGEMENTS

Finamore's work was sponsored by the Canada Department of Regional Economic Expansion. J. Chandra conducted the hammer seismic surveys referred to above. H. Lohse, R. Brinsmead, and J. Thibault provided assistance in the preparation of the original report, which was reviewed by D. Barnett and J. Hamilton.

Seaman was assisted in the field by Christina McLellan, who also performed the pebble lithology analyses recorded in Appendix A. This report was typed by Diane Blair. The figures were drafted by Terry Leonard, and the map plate by Vanderklift Exploration Services. The report, map, and figures were edited by Shasta A. Abbott.

PHYSIOGRAPHY AND GEOLOGY

PHYSIOGRAPHY

Drainage: Most of the modern rivers and streams of the map area "reflect ice controlled late glacial drainage" (Gadd 1973). Major waterways such as the Digdeguash, Magaguadavic, New, and Pocologan rivers, all of which drain into the Bay of Fundy, were outlets for glacial waters during deglaciation.

Many of the lakes in the map area owe their existence to "drift-damming". Gadd (1973) points out that Lake Utopia was dammed by the morainic system lying to the south of this lake. The occurrence of esker segments adjacent to Long and Dam lakes,

Clear Lake, and Jerry Pond suggest that these bodies of water are a direct result of "drift-damming".

Relief: The relief along the coastal areas and along major waterways, such as the Magaguadavic River, is generally low with elevations ranging from 0 to 75 metres a.m.s.l. All of the major outwash deposits are located within these low-lying areas.

The northern part of the map area exhibits greater relief; particularly in areas underlain by Devonian felsic intrusive rocks. In these areas, elevations of about 180 metres a.m.s.l. are common, with a maximum elevation of 320 metres a.m.s.l. at Porcupine Mountain. Ice-contact deposits, especially esker-ridge deposits, predominate in areas of higher elevation.

Physiographically, the map area lies within the St. Croix Highlands (Rampton et al. 1984), the subunits of which are outlined in Figure 3.

BEDROCK GEOLOGY

The St. George map area is underlain by a diverse assemblage of rock types, ranging from Precambrian to Mississippian (Alcock and Perry 1960; Potter 1968). Approximately half of the area is underlain by Devonian felsic intrusive rocks (Figure 4). The remainder of the area is underlain primarily by felsic and mafic extrusive rocks, of various ages. However, small areas of sedimentary and metasedimentary rocks are also present.

The Silurian limestone deposits on the Letang Peninsula and Frye Island are among the most economically important rocks of

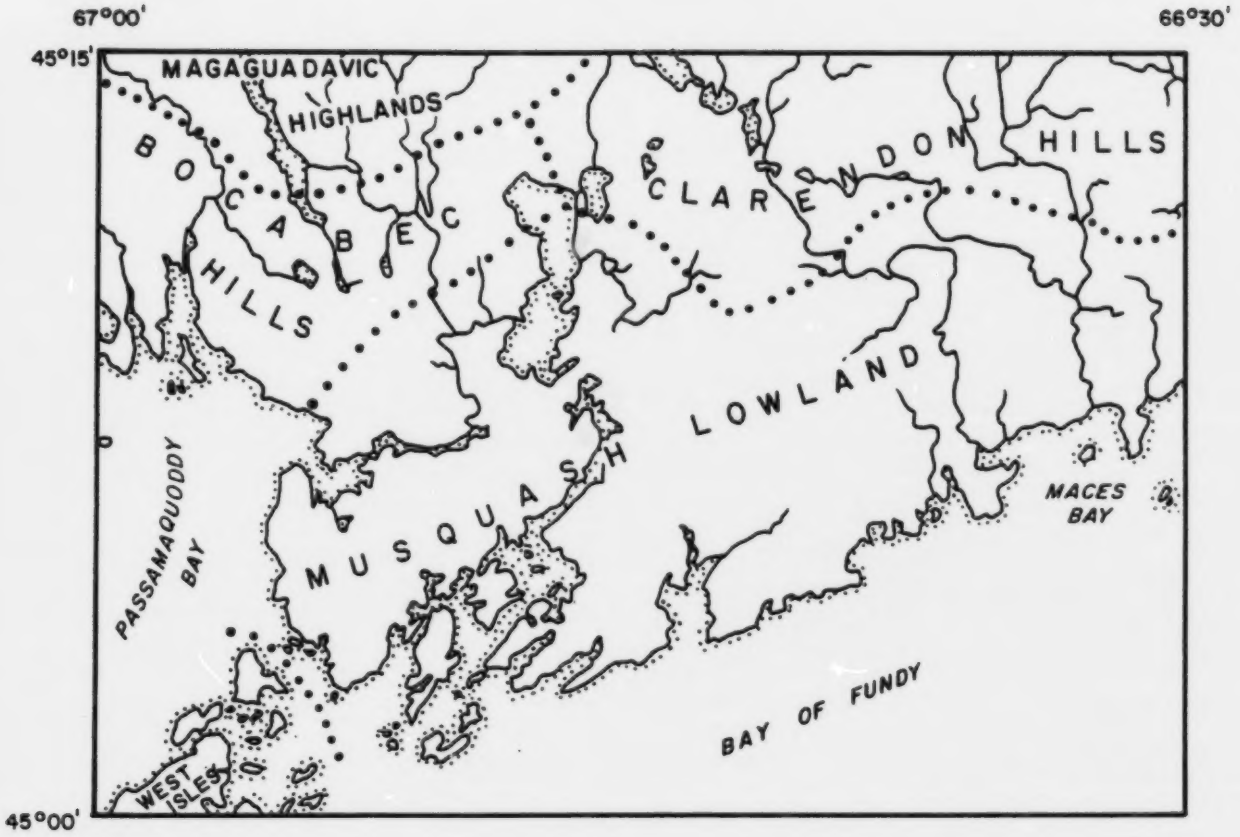

FIGURE 3. Physiographic units of the St. George map area (from Rampton et al. 1984).

the map area. Hamilton (1965) estimates that on the Letang Peninsula alone, over 4 million tons of limestone with an average grade of 85% calcium carbonate is present. The limestone reserves on Frye Island are unknown due to the lack of exposures and structural information.

In the northern part of the map area, Devonian felsic and

mafic intrusive rocks are of considerable economic importance. In the past, they have been quarried for the production of building and monumental stone (Alcock and Perry 1960; New Brunswick Department of Natural Resources 1978; Parks 1914).

The distribution of the major rock types in the St. George map area is outlined in Figure 4. Further details concerning the bedrock geology of the area can be obtained from Alcock and Perry (1960), and from Cumming (1967), Hay (1967, 1968), and Ruitenberg (1968) and references therein.

SURFICIAL GEOLOGY

The study area exhibits well-developed glacial features and provides basic information for the interpretation of the glacial history.

The three large outwash plains centred around Pocologan River, Utopia Centre, and Pennfield Ridge are the most spectacular physiographic features of the study area. Gadd (1973) suggests that each of these outwash plains represent a specific "Phase" of retreat.

The "Pennfield Phase" of deglaciation is represented by the large outwash deposit at Pennfield Ridge. This deposit forms a well-developed plain of glaciofluvial outwash sand and gravel and its formation can be attributed to either a re-entrant in the ice margin or possibly two distinct ice lobes meeting directly north of the deposit. The southern portion of the outwash deposit has been terraced and modified by marine waters.

Subsequent to the "Pennfield Phase" is the "Utopia Phase"

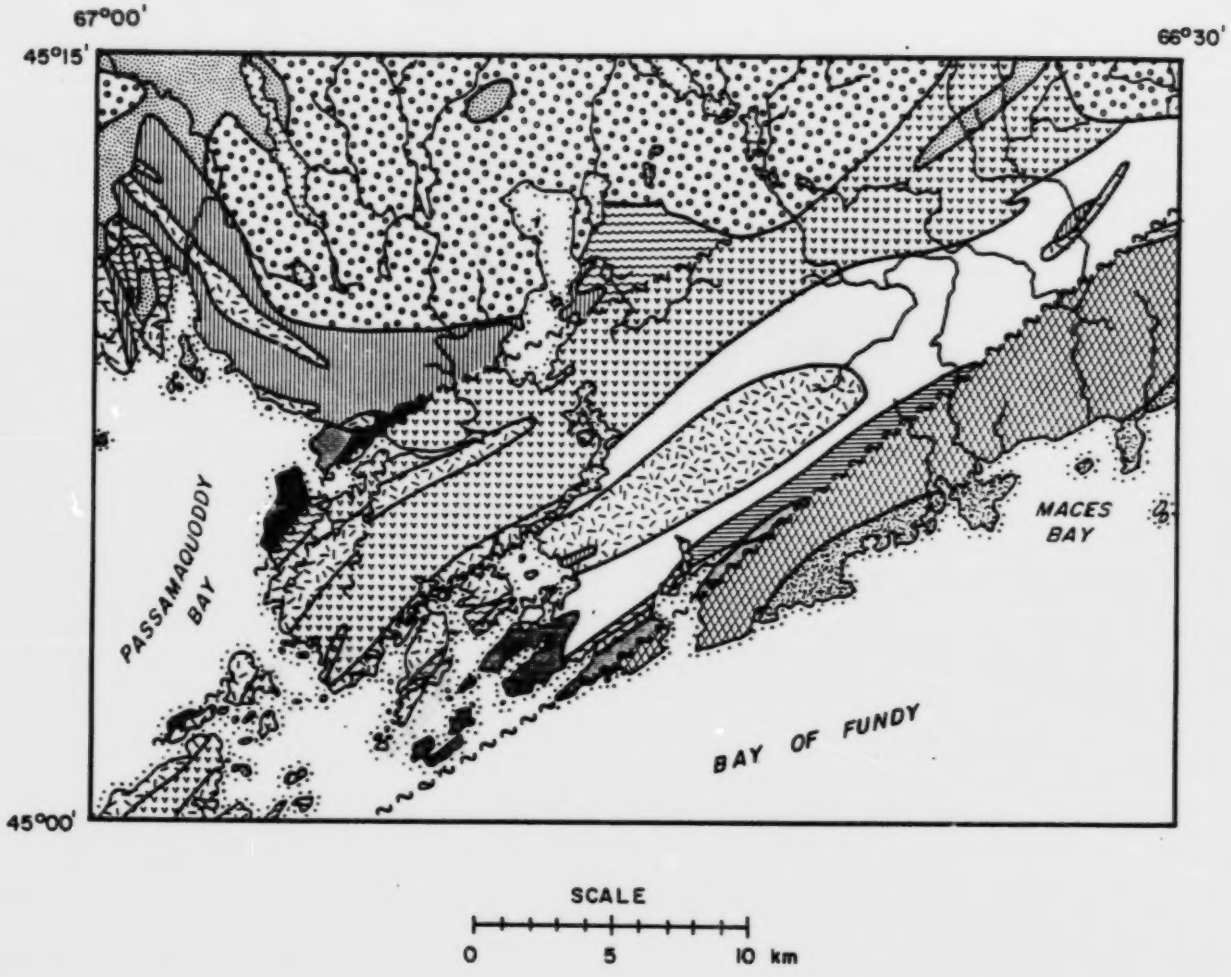

FIGURE 4. Bedrock geology of the St. George map area (from Potter 1968).

of deglaciation. The configuration of the ice margin at Pennfield persisted to form the large outwash deposit centred around Utopia Centre (Gadd 1973). Deposition of this outwash deposit and of the ice-contact deposit south of Lake Utopia, which extends from Roix Lake to the town of St. George, were probably contemporaneous events.

LEGEND

MISSISSIPPIAN

Sedimentary rocks - sandstone, conglomerate, shale

DEVONIAN

Felsic intrusive rocks - granite, quartz monzonite, granodiorite

Mafic intrusive rocks - gabbro, diabase, diorite

Metamorphosed granitic to dioritic rocks, with inclusions of older rocks

Sedimentary rocks - shale, limestone, sandstone, minor greywacke

SILURIAN AND DEVONIAN

Sedimentary and metasedimentary rocks - greywacke, slate, siltstone, sandstone, conglomerate, limestone

Felsic extrusive rocks - rhyolite, trachyte

Mafic extrusive rocks - basalt, andesite

SILURIAN

Interbedded felsic and mafic volcanic rocks, gabbroic sills and dykes, and metasedimentary rocks.

CAMBRIAN

Sedimentary rocks - shale, sandstone, conglomerate, quartzite

PRECAMBRIAN OR LOWER PALAEOZOIC

Felsic to mafic intrusive rocks - granite, granodiorite, quartz diorite, gabbro, gneiss (metamorphic equivalents)

Sedimentary, metasedimentary, volcanic (extrusive) and metavolcanic rocks

SYMBOLS

∿ ∿ ∿ Fault

Further ice withdrawal resulted in the formation of the small outwash delta at Bethel and the large outwash deposit centred on the Pocologan River (the "Bethel-Pocologan Phase" of deglaciation). There appear to have been many sources that formed the latter deposit, an expansive plain of sand and gravel. Seismic profiles completed on the Pocologan River deposit by Chandra (1976) suggest the presence of a buried channel extending parallel or subparallel to the Beaver Harbour Fault (Alcock and Perry 1960). Samples from two localities located along the buried channel (G2-49, G2-164) are texturally distinct from other samples of the deposit. Both of the sample locations comprise large amounts of sand. This may further support the presence of a buried channel.

Subsequent ice recession out of the area was rapid. The fact that there are no major topographic features in the immediate vicinity may have influenced rapid ice retreat.

Indications for marine transgression can be found at various localities in the St. George area. Gadd (1973) has found fossiliferous marine sediments along the south margin of the Pennfield outwash deposit. Organic-rich clay overlain by gravelly sand at Pocologan Harbour (G2-171) and interbedded red and green silty clay, stratigraphically above ice-contact sand and gravel (G2-22, G2-119), are believed to be of marine origin.

Gadd (1973) suggested that maximum marine submergence may have occurred 3 000 years after ice retreat from the area. However, the foreset beds and kettle holes in the Bethel and Pennfield deposits indicate that they are outwash deltas. In

addition, glaciotectonically deformed marine clays have been observed in the St. George moraine, near site G2-119. Consequently, ice withdrawal must have been contemporaneous with the marine transgression.

GRANULAR AGGREGATE RESOURCES

INTRODUCTION

The granular aggregate deposits in the St. George map area contain an estimated 530 million m^3 of sand and gravel. Of this amount, about 100 million m^3 comprises material lying below the water table.

The bulk of this material can be found within the three large outwash deposits of the area. Seismic information (Chandra 1976) was used to supplement field observations. Consequently, the reliability of reserve estimates is greater in those areas where geophysics has been employed.

A high water table was observed in the outwash deposit at Pennfield suggesting that this deposit and possibly other outwash deposits within the map area are recharge areas for groundwater. Thus, problems with the removal of sand and gravel to appreciable depths can be expected.

Wherever the depth to the water table was known, both the amount of sand and gravel above the water table and the amount of sand and gravel for the total thickness of the deposit were calculated. Wherever the depth to the water table was unknown,

granular aggregate reserves were calculated for the total observable thickness of the deposit.

TYPES OF GRANULAR AGGREGATE DEPOSITS

The three major types of granular aggregate deposits in the St. George map area are glaciofluvial outwash, ice-contact stratified drift, and marine shallow-water deposits.

Glaciofluvial outwash deposits consist mainly of sand and gravel washed out of the glacier by meltwater streams. Depending upon the proximity and gradient of the glacier, glaciofluvial outwash can take on a variety of morphological forms. The most common forms are channel deposits, plains, deltas, and valley train deposits.

Glaciofluvial outwash sand and gravel is commonly well sorted and tends to decrease in grain size downstream. Pebbles typically show more rounding with increasing distance of transportation.

In general, glaciofluvial outwash deposits can be considered a good source of clean and workable aggregate.

Ice-contact stratified drift deposits consist of sand and gravel with some cobbles and boulders and varying amounts of silt and clay. They are deposited in contact with the ice (on, under, or adjacent to the glacier).

The most common morphological forms include eskers, moraines, and kames. Ice-contact deposits can be recognized by abrupt changes in grain size, contorted stratification, and internal faults. Massive flowtill is often associated with these deposits.

Eskers, sinuous ridges of sand and gravel, may only require crushing or screening to produce a high-quality aggregate. The sand and gravel in moraines and kames contains variable amounts of silt and clay and may require washing as well as screening and crushing to produce a desirable product. Often, selective quarrying is necessary to avoid masses of flowtill. Kames and moraines may contain well-sorted and clean material, such as that found in those along the Fundy coast.

Shallow-water marine deposits consist of sand and gravel with varying amounts of silt and clay. They include estuarine deposits that generally contain more silt and clay.

Since the area is believed to have been inundated by marine waters to an elevation of about 60 metres a.m.s.l., the deposits found between 30 and 60 metres a.m.s.l. are usually free of silt and clay. Deposits of this nature have been derived from the reworking of glacial deposits. Marine shallow-water deposits below 30 metres a.m.s.l. generally exhibit increasing amounts of silt and clay since they were deposited in deeper water.

MAJOR GRANULAR AGGREGATE SOURCES

The outwash deposit at Utopia Centre contains an estimated 61 million m^3 of sand and gravel. At least 20 million m^3 of the total reserve estimate lies below the water table. For reserve estimation, the deposit was subdivided into several units, as shown in Figure 5.

Of the pebbles from this deposit that were analysed, only 3 to 11% were considered unsound. Thus, the gravel, if crushed, should be an excellent source of coarse aggregate. An abundance of fine-grained sand exists to the north of Spear Brook (G2-130). This part of the deposit should be considered as a source of fine-blending sand.

The Pennfield outwash deposit contains an estimated 162 million m^3 of sand and gravel. At least 51 million m^3 of the total estimate lies below the water table. For reserve estimation, the deposit was subdivided as shown in Figure 6.

This deposit contains an abundance of deleterious sand grains, and a higher percentage of unsound clasts than the Utopia Centre deposit. These characteristics may limit the usefulness of this deposit for production of high-specification aggregate.

The outwash deposit centred on the Pocologan River contains an estimated 224 million m^3 of sand and gravel. Due to the lack of natural and man-made exposures, the depth to the water table is, in places, unknown. At least 35 million m^3 of the total estimated reserves are below the water table. For reserve estimation, the deposit was subdivided into several units as shown in Figure 7.

Some of the samples from this deposit appear to satisfy the requirements for high-specification aggregate. Between 5 and 21% of the pebbles are considered unsound. In general, the eastern half of this deposit has lower percentages of unsound pebbles than the western half. This may be due to the different

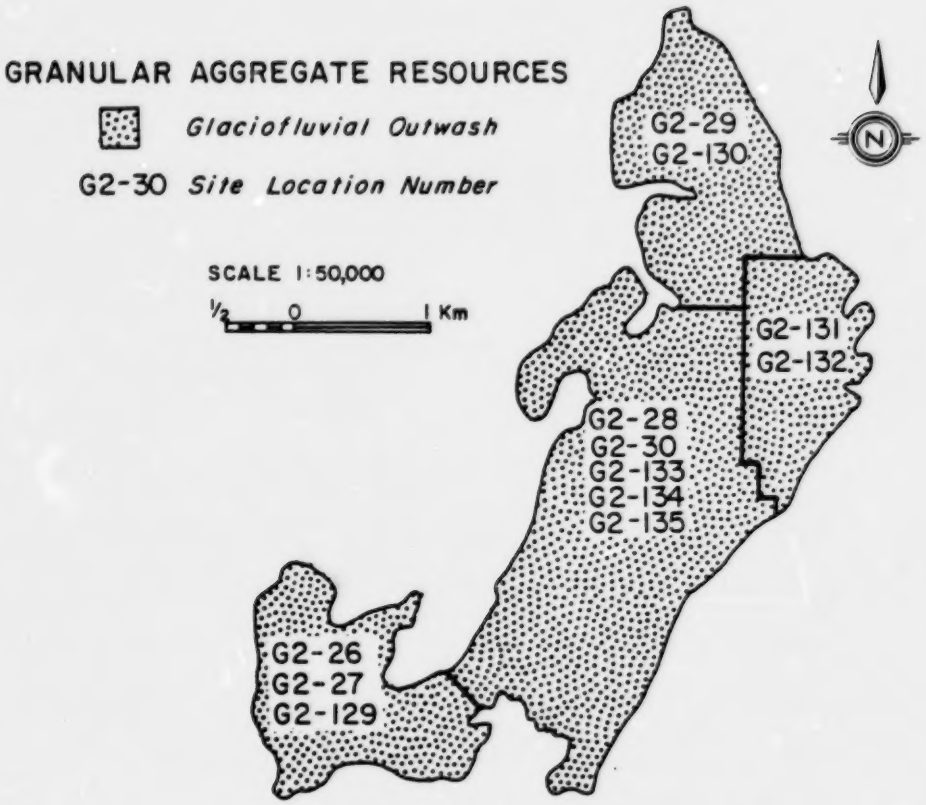

FIGURE 5. Deposit subdivisions for reserve estimation, Utopia Centre outwash deposit.

bedrock sources from which the material was derived.

The ice-contact deposit that flanks the northeastern side of the Pennfield outwash plain (G2-32, G2-33) contains an estimated 21.4 million m^3 of sand and gravel. Many cobbles and small boulders are distributed upon the hummocky surface of this deposit. Numerous deleterious sand grains and high percentages of unsound pebbles are present.

The outwash delta at Bethel contains an estimated 8 million m^3 of sand and gravel. Much of the material is coarse. Most is of good quality, and is suitable for crushing. However,

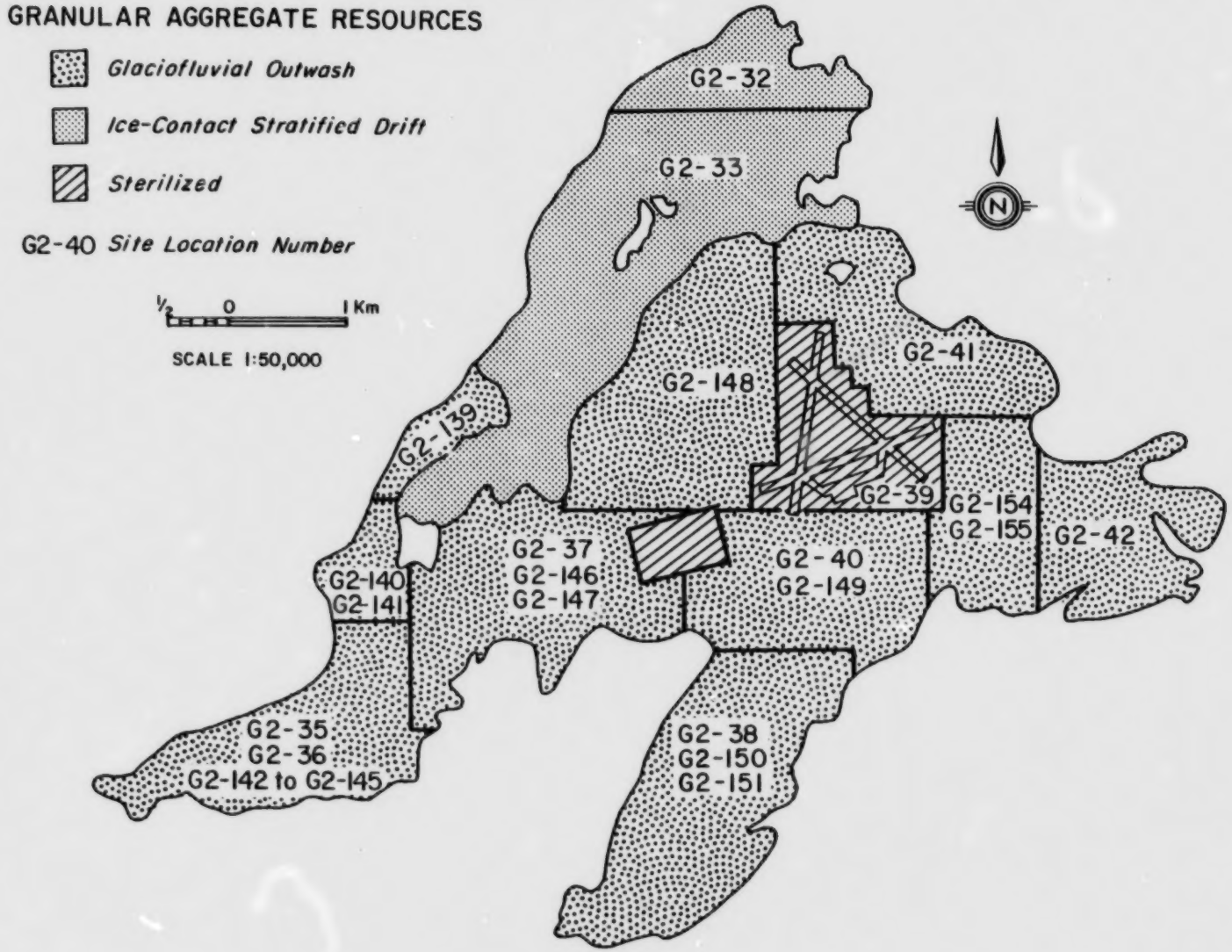

FIGURE 6. Deposit subdivisions for reserve estimation, Pennfield outwash deposit.

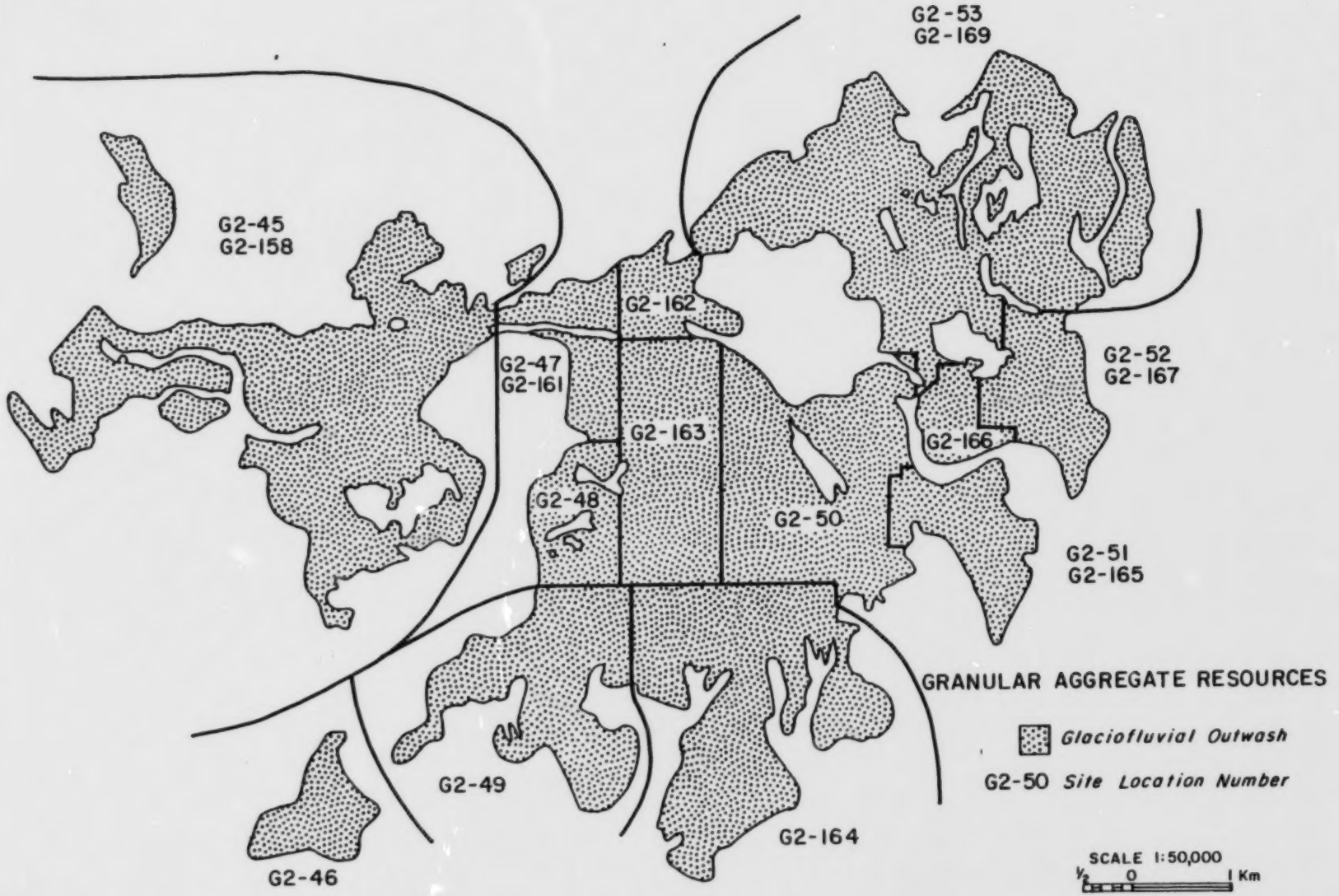

FIGURE 7. Deposit subdivisions for reserve estimation, Pocologan River outwash deposit.

some of the material is of poorer quality, due to grading deficiencies.

The ice-contact and outwash deposits west of Red Rock Lake contain about 6.5 million m^3 of material. Most of the material comprises gravelly sand.

The remaining deposits in the area contain less than 3 million m^3 of material each. Details concerning these deposits, and further details on the major deposits, can be found in the Appendices.

CONCLUSIONS

The St. George map area contains an estimated 428 million m^3 of workable sand and gravel. An additional volume of potentially workable material, in excess of 100 million m^3, lies below the water table.

Approximately 85% of the workable reserves occur in three deposits: the Utopia Centre outwash delta, the Pennfield ice-contact/outwash delta complex, and the Pocologan River outwash delta. In addition, all of the potentially workable material lies in these deposits. A wide variety of gradations of both fine and coarse aggregate are present in these deposits. Quality is generally good.

The remaining 15% of the material is distributed throughout the map area in a number of significant ice-contact, outwash, and shallow-water marine deposits. Both fine and coarse aggregate are to be found in these deposits. The materials vary from poor to good in quality.

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APPENDIX A

SITE DESCRIPTIONS OF THE NORTHWESTERN PART OF THE ST. GEORGE MAP AREA

(Seaman 1986)

LOCATION:	G2-1	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact (esker)	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint Patrick
STATUS:	Active-on-demand	**UTM:**	583 045

SECTION DESCRIPTION & COMMENTS:

North Pit, West Face

0.5 m Soil: Silty soil, developed on the underlying material.

1.1 m Sandy Gravel: Cross-bedded (southward-dipping) very fine to coarse gravel and medium to coarse sand.

0.6 m Clay: Faintly laminated, dense greyish brown clay.

4.8 m Sand and Sandy Gravel: Interbedded sand and sandy gravel beds, ranging from 0.1 to 0.7 m in thickness; approximately 80% of the unit consists of sand beds; very fine to fine sand beds are dominant, but the material varies from silty very fine sand, to sandy fine to coarse gravel; Sample A was obtained from this unit.

0.9 m Slump Covered: Assumed to be material similar to that above (sandy gravel is at the top); bedrock ridges are locally present at the base of the pit.

South Pit, North Face

0.5 m Soil: Developed on the underlying material.

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass. A			100.0	98.2	95.6	91.7	86.5	80.4	68.7	33.7	8.7
B	98.4	85.8	81.7	72.8	63.5	49.9	32.6	16.3	6.3	2.4	1.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 35%	Sound Lithotypes 65%
felsic intrusive 11; mafic intrusive 6; weathered 5; sandstone 4; schist 3; chert 2; shale 2; metasedimentary 1; slate 1	felsic intrusive 25; mafic intrusive 19; quartzite 5; metasedimentary 4; felsic extrusive 3; mafic extrusive 3; argillite 3; sandstone 1; greywacke 1; quartz 1

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
21	8	5	400 000

LOCATION #: G2-1 (cont'd)

1.9 m Sandy Gravel: 1.1 m of faintly stratified fine to very coarse gravel and coarse to very coarse sand, overlying 0.8 m of cross-bedded (southward-dipping) very fine to medium gravel and medium to very coarse sand.

1.0 m Gravelly Sand: Massive, gravelly medium to very coarse sand.

3.3 m Slump Covered: Assumed to be material as above.

Sample B is a composite from the above section. Maximum section height is 13.4 m.

Clasts in this deposit are subrounded to well-rounded. Maximum clast size is 1.0 m. However, large clasts are rare; clasts exceeding 0.1 m in size are estimated to comprise less than 1% of the material.

The pit area has been tested by DOT (1964, 1975). The results of their testing of 18 samples are summarized below:

Mechanical Analysis - coarse aggregate (9 samples)
88 to 100% passing 50 mm (average 96%)
41 to 57% passing 4.75 mm (average 48%)
1.1 to 7.8% passing 75 um (average 3.5%)

- fine aggregate (9 samples)
74 to 100% passing 4.75 mm (average 91%)
1.3 to 12.8% passing 75 um (average 3.0%)

Los Angeles abrasion loss: 18.6 to 21.4% (average 19.9%)

The coarse aggregate was recommended for use as borrow and subbase material; some was suitable for base-course usage. The fine aggregate was recommended for use as borrow, and as possible blending, filter, and winter sand.

This deposit, the Bocabec esker, is a broad esker ridge that exhibits some glaciotectonic deformation structures on its flanks. Its topographic expression is muted by the subsequent deposition of marine sediments along its flanks. It was deposited atop a ridged bedrock surface. Exposed bedrock ridges record three phases of ice flow: at 156° (first), 175°, and 190° (last).

Most of the remaining workable reserves are in the southern part of the deposit.

LOCATION:	G2-2	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact (esker)	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Road cut	**PARISH:**	Saint Patrick
STATUS:	Undeveloped	**UTM:**	621 053

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Slightly silty soil, developed on the underlying material.

1.4 m Sandy Gravel: Crudely subhorizontally stratified, slightly cobbly very fine to very coarse gravel and medium to very coarse sand; clasts are subangular to rounded, with moderate silt coatings; maximum clast size is 0.3 m; clasts exceeding 0.1 m in size are estimated to comprise 2 to 5% of the unit.

1.3 m Slump Covered: Assumed to be material as above; the lower flanks of the deposit are blanketed by marine silt.

This low esker appears to be a side branch of the main Digdeguash River esker. It appears to feed into a small outwash delta to the southwest. Road cuts along the eastern margin of the latter deposit expose about 1 m of sandy gravel to the north, and sand to the south. The thickness of this deposit is unknown; consequently, the thickness estimate is very conservative.

The reserve estimate pertains to the delta, and to the western esker ridge south of G2-106.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass.	77.7	58.9	52.2	38.8	29.3	21.7	14.7	8.2	2.6	1.2	0.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 20%	Sound Lithotypes 80%
shale 6; mafic intrusive 4; chert 3; weathered 3; slate 2; felsic intrusive 1; conglomerate 1	mafic intrusive 17; felsic intrusive 13; felsic extrusive 13; argillite 9; mafic extrusive 8; quartzite 7; metasedimentary 6; quartz 2; conglomerate 1; sandstone 1; siltstone 1; metavolcanic 1; gneiss 1

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
20	20	2	400 000

LOCATION:	G2-3	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact (esker)	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint Patrick
STATUS:	Inactive	**UTM:**	632 045

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil, developed on the underlying material.

0.2 m Sandy Gravel: Predominantly very fine to medium gravel and fine to coarse sand; laterally variable into gravelly sand or coarser, cobbly sandy gravel.

0.5 m Sand: Subhorizontally laminated fine to coarse sand, with a few silty bands.

1.1 m Sandy Gravel: 0.6 m of cobbly medium to very coarse gravel and medium to coarse sand, over fine to very coarse gravel and fine to medium sand; clasts are subangular to rounded, with light to moderate silt coatings; maximum clast size is 0.3 m; the sample was obtained from this unit.

1.4 m Slump Covered: Assumed to be material as above.

This pit was opened in the east flank of the Digdeguash River esker. The esker crest is 7.6 m above the base of the pit.

Six samples were obtained from this site by DOT (1975) for analysis as pit run material. A further two samples were combined and crushed prior to analysis. The test results were as follows:

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass.	68.4	44.6	39.9	31.9	28.2	25.7	22.1	16.3	10.0	6.2	3.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 45%	Sound Lithotypes 55%
chert 9; shale 8; schist 8; felsic intrusive 4; weathered 4; metavolcanic 3; slate 3; mafic intrusive 2; felsic extrusive 1; conglomerate 1; sandstone 1; metasedimentary 1	quartzite 11; felsic intrusive 7; mafic intrusive 7; argillite 5; metasedimentary 5; felsic extrusive 4; metavolcanic 4; quartz 4; mafic extrusive 2; limestone 2; gneiss 2; conglomerate 1; greywacke 1

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
2	2	3	60 000

LOCATION #: G2-3 (cont'd)

Pit Run Material

Mechanical Analysis

78 to 89% passing 50 mm (average 85%)
32 to 56% passing 4.75 mm (average 39%)
1.8 to 5.4% passing 75 um (average 3.3%)

Los Angeles abrasion loss: 16.9 to 18.7% (average 17.9%)

Crushed Material

Mechanical Analysis

50% passing 4.75 mm; 3.7% passing 75 um

Absorption: stone, 1.21%; sand, 1.92%
Soundness Loss: stone, 1.96%; sand, 4.21%
Sand Equivalent: 73

Recommended for use as borrow, subbase, base, and cover aggregate.

LOCATION:	G2-4	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash (delta)	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint Patrick
STATUS:	Active	**UTM:**	629 031

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil, developed on the underlying material; locally removed.

1.9 m Sandy Gravel: Crudely horizontally stratified topset beds of medium to very coarse gravel and coarse to very coarse sand, with rare cobbles; clasts are subangular to rounded, with moderate silt coatings; Sample A was obtained from this unit.

2.9 m Sand and Gravelly Sand: Cross-bedded foreset beds, dipping west-southwest, of variable character; where sampled (Sample B), the unit is approximately 50% gravelly medium to coarse sand, 45% well-sorted medium sand, and 5% slightly silty very fine to fine sand; laterally, some of the foreset beds consist of sandy gravel almost as coarse as the upper, topset beds.

0.2 m Slump Covered: Assumed to be material as above.

A small lower lift extends 1.5 m below the base of the main lift floor. Maximum pit depth is 7.9 m.

Most of the material in the foreset beds is sandy. However, locally they consist of a sandy gravel only slightly finer than the topset beds. A few small boulders are present in the pit area, and a single large erratic 1.5 m in size.

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass. A	83.1	58.8	53.6	40.6	32.0	25.0	16.5	7.6	3.0	1.5	0.9
B		100.0	98.1	95.6	92.2	87.3	77.5	52.7	19.9	4.1	1.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 45%	Sound Lithotypes 55%
weathered 10; felsic intrusive 8; shale 8; slate 6; chert 5; mafic intrusive 3; mafic extrusive 3; metasedimentary 1; schist 1	felsic intrusive 15; quartzite 10; mafic intrusive 9; metasedimentary 6; felsic extrusive 4; mafic extrusive 3; metavolcanic 3; argillite 2; conglomerate 1; sandstone 1; greywacke 1

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
25	5	8	400 000

LOCATION #: G2-4 (cont'd)

The pit area has been intensively sampled by DOT (1979). The results of their tests, on 17 samples, were as follows:

Pit Run Material
Mechanical Analysis
72 to 100% passing 50 mm (average 87%)
30 to 56% passing 4.75 mm (average 40%)
1.4 to 13.1% passing 75 um (average 3.1%)

Los Angeles abrasion loss: 17.9 to 21.5% (average 19.6%)

Crushed Material
Mechanical Analysis
50% passing 4.75 mm; 3.4% passing 75 um

Absorption: stone, 1.14%; sand, N.A.
Soundness Loss: stone, 2.24%; sand, 3.40%
Sand Equivalent: 70

Recommended for use as borrow, subbase, base, and asphaltic concrete aggregate, and as surface treatment chips.

This pit was developed in the northwestern lobe of the Bethel delta. The reserve estimate pertains only to this northwestern part of the deposit (including sites G2-107 and 108). See G2-5 for information on the remainder of the deposit.

LOCATION:	G2-5	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash (delta)	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint Patrick
STATUS:	Active-on-demand	**UTM:**	633 028

SECTION DESCRIPTION & COMMENTS:

Upper Lift

0.5 m Soil: Silty soil, developed on the underlying material.

6.9 m Cobbly Gravel: Crudely horizontally stratified, cobbly very fine to very coarse gravel, with a matrix of medium to very coarse sand; some parts are bouldery, others are cobble- and boulder-free; contains minor sand lenses; Sample A was obtained from one of the finer major beds in this unit.

2.7 m Slump Covered: Assumed to be material similar to that above; may become finer with depth.

Lower Lift

1.9 m Sandy Gravel: Crudely stratified foreset cross-beds (dipping west-southwestward) of fine to very coarse gravel and medium to very coarse sand; a few coarser, slightly cobbly beds are also present; Sample B was obtained from this unit.

2.9 m Slump Covered: Assumed to be material as above.

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass. A	42.4	29.8	26.9	20.8	16.6	12.4	7.8	4.1	2.2	1.3	1.0
B	93.3	71.9	64.7	41.9	32.2	26.2	18.7	6.8	1.6	0.6	0.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 33%	Sound Lithotypes 67%
mafic intrusive 8; shale 7; weathered 5; felsic intrusive 4; chert 4; siltstone 1; metavolcanic 1; metasedimentary 1; schist 1; slate 1	felsic intrusive 21; quartzite 12; mafic intrusive 9; felsic extrusive 6; mafic extrusive 5; argillite 4; metasedimentary 4; quartz 2; sandstone 1; limestone 1; metavolcanic 1; gneiss 1

ESTIMATION OF RESERVES:

	Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
A	120	60	10	6 million
B	27	15	5	750 000
C	17	17	5+	850 000

LOCATION #: G2-5 (cont'd)

Clasts in this part of the deposit are subangular to rounded, with light silt coatings. Maximum clast size is 0.8 m. Clasts exceeding 0.1 m in size are estimated to comprise 10 to 20% of the material in the upper lift, but less than 1% of that in the lower lift. Maximum pit depth is 14.4 m.

This pit lies close to the point where the Digdeguash River esker fed into the Bethel delta. The material in this area is expected to be the coarsest in the deposit. This is confirmed by the logs of 8 boreholes from the area to the east of the crossroad at Bethel, reported by the International Passamaquoddy Engineering Board (1959). The borehole at Bethel penetrated through 5.6 m of predominantly coarse, cobbly gravel. Boreholes about 400 m from the former revealed approximately 4 m of sandy gravel overlying sand. At boreholes 600 to 800 m from the first, the sandy gravel unit was only about 2 m thick. The underlying sand was locally gravelly, with some silty horizons. The boreholes varied from 1.7 to 10 m in depth, with an average of 6.7 m.

DOT (1965) sampled a site in this part of the deposit. The results of their tests, on one fine aggregate sample and 6 coarse aggregate samples, were as follows:

Mechanical Analysis - fine aggregate
93.7% passing 4.75 mm; 1.3% passing 75 um

- coarse aggregate
90.1 to 100.0% passing 50 mm (average 93.4%)
35.3 to 52.2% passing 4.75 mm (average 44.6%)
1.1 to 2.3% passing 75 um (average 1.7%)

Los Angeles abrasion loss: 16.3 to 17.0%

Recommended for use as borrow, and locally subbase, aggregate only, because of grading deficiencies.

The logs of five boreholes in the southern half of the subsidiary delta deposit, to the southwest of the main Bethel delta, were also reported by the International Passamaquoddy Engineering Board (1959). These boreholes, averaging 5.6 m in depth (range: 1.7 to 10 m), revealed material varying from gravelly sand to sandy gravel. The material in the northern half of this deposit is probably thinner; Alcock and Perry (1960) mapped 3 bedrock outcrops within its limits.

Reserves for this area are estimated in 3 parts: A) for the main Bethel delta, exclusive of the northwestern lobe (see G2-4 for the latter); B) for the subsidiary delta to the southwest; and C) for the presumed ice-contact deposit at the southern end of the main delta. There is no information available for the latter deposit. It has the appearance of a kame delta. It is presumed to be similar to the material at G2-16.

LOCATION:	G2-6	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact (esker)	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Abandoned	**UTM:**	658 119

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Slightly silty soil, developed in a slightly cobbly, sandy very fine to very coarse gravel.

1.6 m Sandy Gravel: Subhorizontally stratified, predominantly very fine to medium gravel and coarse to very coarse sand; clasts are subangular to subrounded, with light to moderate silt coatings; maximum clast size is 0.3 m.

2.0 m Slump Covered: Assumed to be material as above.

The base of the pit is 1.7 m above the level of the adjacent bog.

The crest of this esker generally stands more than 5 m above the level of the adjacent bog. Locally, it is more than 10 m high. The ridges protruding from the flanks of the esker are probably morainic. The material in these may be coarser and less sorted.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass.	93.7	85.7	82.2	66.1	48.9	31.8	13.5	3.8	1.6	1.0	0.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 17%	Sound Lithotypes 83%
felsic intrusive 14; conglomerate 1; schist 1; weathered 1	felsic intrusive 54; sandstone 8; quartzite 4; quartz 4; felsic extrusive 3; mafic extrusive 3; siltstone 1; greywacke 1; argillite 1; limestone 1; metavolcanic 1; metasedimentary 1; gneiss 1

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
49	40	3	1.2 million

LOCATION: G2-7 **NTS:** 21 G/2

TYPE OF DEPOSIT: Ice-contact **COUNTY:** Charlotte

EXPOSURE TYPE: Pit **PARISH:** Saint George

STATUS: Abandoned **UTM:** 684 111

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Slightly silty soil, developed on the underlying material.

1.2 m Sand: Very fine to fine sand, grading downward into fine to medium sand.

0.4 m Sandy Gravel: Very fine to medium gravel and medium to coarse sand, with a few larger clasts; clasts are subrounded.

0.5 m Sand: Well-sorted medium sand, grading downward into fine to medium sand.

5.6 m Slump Covered: Assumed to be mainly sand; however, part of the base of the pit is gravelly, so some gravel may be locally present.

The above section is in the west face of the pit. Silty trough-fill units are locally present in the section. A few large erratics, up to 1.1 m in size, are also present. The east face of the pit is 3 to 4 m high.

The fine texture of this deposit suggests that it may have been formed below sea level. Silt has been observed both overlying and flanking the deposit. This burial by marine sediments has obscured the boundaries of the deposit. Consequently, it may be of significantly greater extent than as mapped.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass.	100.0	99.6	98.7	95.3	89.8	85.1	76.8	60.6	38.0	16.8	4.4

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
24	20	4	800 000

LOCATION:	G2-8	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Abandoned	**UTM:**	682 075

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Slightly silty soil, developed on the underlying material.

1.0 m Sandy Gravel: Clean very fine to medium gravel and medium to very coarse sand; clasts are subangular to subrounded, and primarily granitic; many of the clast are friable.

6.0 m Slump Covered: Assumed to be 2.5 m of material as above; dense sandy silt is exposed 3.5 m above the base of the pit; underlying material may be silt or weathered granite.

A local concentration of cobbles and small boulders up to 0.4 m in size is present at the north end of the pit. It appears to be associated with a gravelly fine to medium sand.

DOT (1980) obtained one sample from this site. It had 79% passing 4.75 mm, and 2.1% passing 75 um. It was obtained from a section comprising 1.8 m of gravelly sand over 0.6 m of silt and clay over granite.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass.	100.0	98.6	95.4	85.8	66.3	44.6	26.5	12.1	5.3	2.3	1.3

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
15	5	2	100 000

LOCATION:	G2-9	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Inactive	**UTM:**	694 072

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Slightly silty soil, developed on the underlying material.

2.5 m Sand: Cross-stratified very fine to fine sand grading downward into fine to medium sand, with thin stringers of well-sorted coarse sand.

1.6 m Slump Covered: Assumed to be material as above.

A few erratic boulders up to 1.5 m in size are present in the pit area.

This deposit is highly variable in texture. Road cuts expose material varying from sand, as above, through to cobbly sandy gravel. Test pitting would be required to determine the character of any particular portion of the deposit. Reserve estimate A pertains to this deposit.

The adjoining marine shallow-water deposit consists of sand, predominantly fine. It is probably thin. Reserve estimate B pertains to this deposit.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass.					100.0	99.9	99.4	94.0	77.6	38.9	9.6

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

	Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
A	70	50	4	2 million
B	48	35	1	350 000

LOCATION:	G2-10	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Road cut	**PARISH:**	Saint George
STATUS:	Undeveloped	**UTM:**	695 047

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil, developed on the underlying material.

1.4 m Cobbly Sandy Gravel: Poorly sorted, crudely stratified, cobbly very fine to very coarse gravel and very fine to very coarse sand; clasts are subangular to rounded, with moderate to heavy silt coatings; maximum clast size is 1.0 m; clasts exceeding 0.1 m in size are estimated to comprise approximately 5% of the unit.

0.9 m Slump Covered: Assumed to be material as above.

The tiny, abandoned pit at the southern end of this deposit is about 6.5 m deep. It exposes 2.2 m of slightly silty sand and cobbly angular gravel (ablation till) overlying at least 0.3 m of dense sandy stony till. It contains many boulders up to 2 m in size.

The deposit consists of a series of alternating ridges, presumably morainic, and low areas filled with marine silt. Road cut exposures indicate that most of the material in the ridges consists of cobbly sandy gravel, similar to that described in the section above.

The position of the eastern margin of this deposit is unknown.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass.	65.0	54.7	50.8	42.8	37.4	31.6	23.2	16.2	11.7	8.5	5.9

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 28%	Sound Lithotypes 72%
felsic intrusive 16; mafic intrusive 3; mafic extrusive 2; slate 2; weathered 2; sandstone 1; chert 1; shale 1	felsic intrusive 40; mafic intrusive 9; felsic extrusive 4; mafic extrusive 3; sandstone 3; quartzite 3; greywacke 2; argillite 2; gneiss 2; quartz 2; siltstone 1; metasedimentary 1

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
22	10	2	200 000

LOCATION:	G2-11	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Marine/Ice-contact(?)	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Road cut	**PARISH:**	Saint George
STATUS:	Undeveloped	**UTM:**	730 119

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed on the underlying material.

1.3 m Silty Sand: Subhorizontally stratified, silty very fine to fine sand, with minor silt bands, and minor thin beds of fine to medium sand.

0.7 m Slump Covered: Assumed to be material as above.

Road cuts through the deposit area generally expose 1 to 1.5 m of sand, predominantly fine. However, two ridges in the deposit expose cobbly gravelly material that may be ablation till or ice-contact stratified drift. The deposit is assumed to consist of a blanket of shallow-water marine sands over ice-contact material. Test pitting would be required to confirm this. DOT (1980) test pitting near this site indicates that the higher relief areas within this deposit may be underlain by bedrock.

DOT (1980) obtained 3 samples from near this site. Two were silty very fine to fine sands, similar to that described above, except for higher silt content (29.2 and 30.7% passing 75 um). The third was somewhat coarser, with 97% passing 4.75 mm and 12.7% passing 75 um. The material was approved only for use as borrow.

Due to the lack of information concerning this deposit, the reserve estimate is only for the marine sand deposit.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% pass.						100.0	99.5	97.8	88.2	47.4	18.2

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
175	150	1	1.5 million

APPENDIX B

SITE DESCRIPTIONS OF THE SOUTHWESTERN AND EASTERN PARTS OF THE ST. GEORGE MAP AREA

(Finamore 1975)

LOCATION:	G2-12 (121)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Road cut	**PARISH:**	Pennfield
STATUS:	Undeveloped	**UTM:**	754 124

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed on the underlying material.

1.2 m Gravelly Sand: Predominantly medium-grained sand with fine-grained gravel; appears stratified; clasts are subrounded to rounded; maximum clast size is 0.1 m.

This deposit may contain large reserves of sand and gravel.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		93.6	90.4	82.1	74.0	63.7	50.1	19.2	3.0	1.0	0.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 16%	Sound Lithotypes 84%
sandstone 11; shale 5	felsic and mafic extrusive 41; felsic intrusive 25; quartzite 18

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
56	20	9	1.8 million
	36	3.5	1.3 million

LOCATION:	G2-13 (133)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Pennfield
STATUS:	Active-on-demand	**UTM:**	760 126

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Developed on the underlying material.

0.9 m Sand and Gravel: Subhorizontally stratified, poorly sorted sand and fine-grained gravel.

1.5 m Sand: Stratified, predominantly medium-grained sand with some fine-grained gravel; Sample A was taken from this unit.

3.1 m Silty Sand: Silty fine-grained sand; Sample B was taken from this unit.

5.8 m Slump Covered: Assumed to be sand or gravel.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A			99.6	98.9	94.6	82.2	66.3	39.4	16.2	2.1	0.2
B						100.0	99.9	99.4	98.2	68.9	21.8

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
110	12	12	1.4 million
	14	4.5	630 000
	68	2	1.4 million

LOCATION:	G2-14 (129)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Active-on-demand	**UTM:**	748 052

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Developed on the underlying material.

5.5 m Sand: Subhorizontally stratified fine-grained sand with some silty layers; very compact in places; contains many faults.

8.8 m Slump Covered: Predominantly medium-grained sand with a few pebbles; the sample was taken from the talus slope, and is not representative of the gravel component of the material.

The grain size varies irregularly in the pit. A 3 m thick bed of flowtill(?) is exposed at the east side of the pit. Very coarse, cobbly sand and gravel is present in places. Maximum clast size is 0.9 m. However, sand is predominant.

(What appears, from the aerial photographs, to be an ice-contact delta may be present between Mill Lake and Trout Lake, extending eastward to Colonel Brook. If aggregate is present in this area, reserves could be quite large; potentially in the order of 10 million m^3. A.S.).

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		99.2	99.2	98.4	97.1	92.0	79.7	47.2	13.1	1.5	0.5

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
16+	8	13	1 million

LOCATION:	G2-15 (85)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Inactive	**UTM:**	675 030

SECTION DESCRIPTION & COMMENTS:

3.0 m Sand and Gravel: Clean, medium- to coarse-grained sand and fine- to coarse-grained gravel; Sample A was taken from this unit.

1.8 m Gravelly Sand: Poorly sorted sand with fine-grained gravel; the gravel becomes finer with depth; Sample B was taken from this unit.

7.3 m Slump Covered: Assumed to be sand and gravel; an auger hole at the base of the slope penetrated 0.8 m of fine-grained sand with silty and clayey layers.

In another part of the pit, at the base of the section, 0.9 m of stratified sand and gravel was exposed. The material was medium- to coarse-grained sand and fine-grained gravel. Maximum clast size in this unit was 75 mm. Sample C was taken from this unit.

Clasts in the deposit are subrounded.

(This deposit appears to be an outwash delta. A.S.).

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A	87.6	72.5	67.3	52.1	41.9	28.9	17.7	3.6	1.0	0.6	0.4
B		99.4	98.4	92.9	86.3	75.4	66.1	46.0	13.3	3.7	0.3
C		97.6	92.1	64.4	42.4	26.6	20.6	10.6	1.6	0.5	0.3

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 7%	Sound Lithotypes 93%
sandstone 5; schist 1; weathered 1	felsic and mafic intrusive 55; felsic and mafic extrusive 29; quartz and quartzite 9

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
92	71	3.5+	2.5 million

LOCATION:	G2-16 (87)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Active-on-demand	**UTM:**	667 012

SECTION DESCRIPTION & COMMENTS:

This pit had a maximum face height of 16.5 m. The deposit is stratified, with the beds dipping both eastward and westward from the apex. The sample was taken from a 3 m high section of poorly sorted sand and gravel at the east end of the pit. Glaciomarine silts and clays were observed at the western end of the pit. Approximately 75% of the material in the pit is sand or finer material.

Clasts in the deposit are subrounded. A high percentage of felsic extrusive clasts are present.

Typical esker bedding is present, although there is no morphological evidence to suggest that this deposit is an esker.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		89.7	83.9	69.8	57.7	48.8	43.9	35.2	16.7	3.5	0.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 10%	Sound Lithotypes 90%
sandstone 10	felsic and mafic extrusive 63; felsic and mafic intrusive 14; quartzite 13

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
19+	16	3.5+	560 000

LOCATION:	G2-17 (86)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Marine shallow-water(?)	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Active-on-demand	**UTM:**	668 009

SECTION DESCRIPTION & COMMENTS:

7.6 m Sand: Horizontally stratified, predominantly fine-grained sand with some gravelly layers; clasts are subangular.

To the west of the above section, this unit is overlain by till and underlain by laminated silt and clay.

(This deposit lies well below the marine limit in the area. Consequently, it is more likely to be of glaciomarine origin, rather than glaciolacustrine, as suggested by Finamore. It could alternatively be of subaqueous ice-contact origin. A.S.)

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		100.0	98.3	92.3	86.4	80.4	76.3	67.6	43.9	12.3	2.6

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
36	18	3.5	630 000

LOCATION:	G2-18 (83)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Inactive	**UTM:**	679 014

SECTION DESCRIPTION & COMMENTS:

0.5 m Silty Sand: Silty fine-grained sand with some pebbles and a few cobbles.

2.5 m Sand: Cross-stratified (southwestward-dipping), predominantly medium-grained sand with a few pebbles; the sample was taken from this unit.

The above section was in the western face of the pit. The east face was 9.4 m high and displayed a cobbly and coarse gravelly sand unit (similar to the lower unit above).

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.			100.0	99.9	99.6	95.6	83.6	41.6	10.2	1.2	0.1

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
62	28	2	560 000

LOCATION:	G2-19 (79)	NTS:	21 G/2
TYPE OF DEPOSIT:	Ice-contact	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Saint George
STATUS:	Inactive	UTM:	689 989

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil, developed in a sand and gravel unit.

2.4 m Gravelly Sand: Cross-stratified (southwestward-dipping) medium- to coarse-grained sand with fine-grained gravel; clasts are subrounded and partially silt coated.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		93.9	93.0	86.3	70.3	48.4	27.1	3.4	1.1	0.8	0.7

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
5	3	2.5	75 000

LOCATION:	G2-20 (75)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Inactive	**UTM:**	719 025

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Developed on the underlying material.

0.9 m Sand: Predominantly fine-grained sand.

0.6 m Silty Sand: Horizontally stratified layers of fine-grained sand and silt, with a few cobbles and boulders.

3.1 m Gravelly Sand: Predominantly medium-grained sand with fine-grained gravel; clasts are subrounded; the sample was taken from this unit.

1.5 m Slump Covered: Assumed to be sand and gravel.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.			100.0	93.1	83.4	72.1	61.8	37.1	13.9	2.8	0.4

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
24	18	3.5	630 000

LOCATION:	G2-21 (70)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Inactive	**UTM:**	709 983

SECTION DESCRIPTION & COMMENTS:

0.3 m Soil

1.5 m Sand and Gravel: Compact and massive, predominantly fine-grained sand and poorly sorted gravel and cobbles; the sand fraction becomes coarser with depth.

1.8 m Sand and Silt: Horizontally stratified, interbedded layers of sand and silt grading from medium-grained sand to clayey silt; the upper 0.3 m is gravelly.

1.8 m Sand and Gravel: Fine- to medium-grained sand and fine- to coarse-grained gravel; clasts are subangular and partially silt coated; Sample A was taken from this unit.

7.4 m Slump Covered: Assumed to be sand and gravel; Sample B was taken from this level (about 10.5 m below the surface) elsewhere in the pit; the material was a fine- to medium-grained sand, with some fine-grained gravel containing an abundance of deleterious (shale?) particles.

(A new pit in this deposit, to the north of this pit, and northwest of G2-119, exposes extensive faulting and folding due to overriding by glacier ice, that locally deposited several metres of till. A.S.).

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A	87.8	69.4	62.1	46.9	38.4	33.8	30.8	24.9	14.6	4.7	1.6
B		100.0	98.1	90.2	78.0	66.7	52.9	27.9	10.0	2.4	0.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 13%	Sound Lithotypes 87%
sandstone and conglomerate 5; shale 4; schist 4	felsic and mafic extrusive 68; quartzite 14; felsic and mafic intrusive 5

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
57	10	18	1.8 million
	18	2.5	450 000

LOCATION:	G2-22 (76)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Marine/Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Inactive	**UTM:**	725 002

SECTION DESCRIPTION & COMMENTS:

0.3 to 0.9 m Soil: Silty soil, developed in a sand and gravel unit (marine).

2.4 m Sand, Silt and Clay: Interstratified red and green laminae grading from fine-grained sand to silty clay (marine).

13.7 m Sand and Gravel: Poorly sorted sand and imbricated gravel; the upper 2.4 m is very cobbly; clasts are subangular to subrounded, and are silt coated; Sample A was taken from this unit (ice-contact).

3.1 m Slump Covered: Assumed to be sand and gravel.

Sample B was taken from a 2 m thick unit at the top of a 7.6 m section at the south end of the pit. The material represented by this sample overlies silty sand and gravel with some possible till lenses. Bedrock is locally exposed at the base of the pit.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	A	86.9	82.6	64.2	49.4	36.6	27.0	12.8	4.0	1.4	0.9
	B	100.0	98.7	88.9	76.5	64.4	52.8	27.8	6.7	0.8	0.5

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 7%	Sound Lithotypes 93%
schist 5; sandstone 1; shale 1	felsic and mafic extrusive 77; quartz and quartzite 11; felsic and mafic intrusive 5

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
15	8	3.5	280 000

LOCATION:	G2-23 (67, 68)	NTS:	21 G/2
TYPE OF DEPOSIT:	Marine shallow-water	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Saint George
STATUS:	Active	UTM:	734 992

SECTION DESCRIPTION & COMMENTS:

South Face (A)

0.6 m Soil: Slightly silty soil, developed on the underlying material.

0.5 m Sand and Gravel: Horizontally stratified, predominantly fine- to medium-grained sand and fine-grained gravel; some coarse gravelly layers are present; clasts are subrounded to rounded.

3.2 m Sand and Gravel: Cross-bedded (southward-dipping), poorly sorted sand and gravel, with numerous gap-graded horizons; abundant shale and schist clasts were noted.

3.0 m Slump Covered: Assumed to be sand and gravel; a test pit indicated that till lies below the base of the pit.

North Face (B)

0.2 m Soil

0.7 m Sand and Gravel: Horizontally stratified, predominantly fine-grained sand and fine-grained gravel.

3.7 m Gravelly Sand: Cross-bedded (southward-dipping), predominantly medium- and coarse-grained sand with fine-grained gravel; contains numerous gap-graded horizons; abundant shale and schist clasts were noted.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	A	73.2	69.0	51.8	38.8	26.2	19.5	11.0	5.6	2.2	0.6
	B	94.2	90.2	82.2	69.6	48.7	32.4	12.4	4.7	1.2	0.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 9%	Sound Lithotypes 91%
sandstone and conglomerate 6; shale 1; chert 1; schist 1	felsic and mafic extrusive 74; quartzite 13; felsic intrusive 4

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
36	12	5.5	660 000
	16	2.5	400 000

LOCATION:	G2-24 (34)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Refuse pit	**PARISH:**	Saint George
STATUS:	Inactive	**UTM:**	753 022

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil

4.9 m Sand and Gravel: Horizontally stratified fine- to medium-grained sand and fine- to coarse-grained gravel; contains a few cobbly horizons; clasts are predominantly subrounded; Sample A was taken from this unit.

1.5 m Sand: Predominantly fine-grained sand with some fine gravelly layers; Sample B was taken from this unit.

3.7 m Slump Covered: Assumed to be sand and gravel.

This part of the deposit has been sterilized by industrial development (a paper mill).

(From the aerial photographs, it appears that this deposit may extend northeast toward Colonel Brook. If so, reserves could potentially be in the order of several million m^3. A.S.).

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A	83.9	79.8	77.1	67.2	57.2	47.6	40.8	28.0	13.3	4.2	0.9
B		100.0	99.1	97.9	96.3	93.5	92.1	83.0	42.4	10.4	1.9

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 3%	Sound Lithotypes 97%
sandstone 3	felsic and mafic extrusive 44; felsic and mafic intrusive 30; quartz 23

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
			Sterilized

LOCATION:	G2-25 (66)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Saint George
STATUS:	Active-on-demand	**UTM:**	751 983

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil, developed on the underlying material.

21.0 m Sand and Gravel: Predominantly medium- and coarse-grained sand and fine- to coarse-grained gravel, with some cobbles and boulders; clasts are subangular to subrounded; numerous granitic boulders are present in the upper 12 m (not necessarily in place); an abundance of shale and schist clasts were observed in the upper 3 m; Sample A was taken from a section 1.5 to 3 m below the surface; Sample B was taken from a depth of 16.8 m.

This mound-shaped deposit is probably a kame. According to the pit owner, the gravel failed tests conducted by DOT, presumably soundness tests.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	A	86.5	80.6	65.0	47.4	30.6	18.3	5.6	2.3	1.2	0.8
	B	100.0	96.8	89.4	75.0	55.5	32.9	7.3	2.2	1.2	0.9

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 9%	Sound Lithotypes 91%
sandstone 4; schist 3; shale 2	quartz and quartzite 57; felsic and mafic extrusive 25; felsic and mafic intrusive 9

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
22	12	15	1.8 million
23	16	unknown	unknown

LOCATION:	G2-26 (32)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Pennfield
STATUS:	Active-on-demand	**UTM:**	763 016

SECTION DESCRIPTION & COMMENTS:

0.3 m Soil

1.5 m Sandy Gravel: Fine- to coarse-grained gravel with medium- and coarse-grained sand and numerous cobbles; clasts are subangular, and are horizontally imbricated; Sample A was taken from this unit.

5.8 m Gravelly Sand: Poorly sorted sand with predominantly fine-grained gravel; the gravel becomes coarse and cobbly toward the base of the unit; clasts are predominantly subangular; Samples B and C were taken from this unit.

0.5 m Sand and Gravel: Poorly sorted sand and gravel with numerous cobbles.

Maximum clast size is 0.5 m. Reserves are estimated for the area indicated in Figure 5.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass A	80.5	60.8	54.2	45.0	34.5	22.7	13.6	3.0	0.8	0.4	0.3
B		98.5	95.6	89.1	79.6	68.1	52.8	12.1	1.1	0.3	0.2
C		92.6	92.2	87.4	81.8	75.1	67.9	37.1	7.2	1.2	0.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 9%	Sound Lithotypes 91%
shale 8; chert 1	felsic and mafic extrusive 37; felsic and mafic intrusive 35; quartzite 19

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
170	120	8	9.6 million
	20	3.5	700 000

LOCATION:	G2-27 (56)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Pennfield
STATUS:	Inactive	UTM:	775 010

SECTION DESCRIPTION & COMMENTS:

0.3 m Soil: Silty soil, developed on the underlying material.

0.6 m Sand and Gravel: Poorly sorted sand and gravel; clasts are subrounded and partially silt coated; Sample A was taken from this unit.

4.0 m Sand: Predominantly fine- and medium-grained sand; slightly gravelly near the top of the unit; Sample B was taken from this unit.

2.4 m Slump Covered: Assumed to be sand or gravel.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A	85.1	78.1	76.8	65.9	50.5	36.0	25.0	8.7	2.6	1.2	0.8
B						99.8	99.5	88.2	40.5	10.2	1.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 4%	Sound Lithotypes 96%
sandstone 2; chert 2	felsic intrusive 63; quartz and quartzite 20; felsic and mafic extrusive 13

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
			See G2-26

LOCATION:	G9-28 (29)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Pennfield
STATUS:	Active-on-demand	**UTM:**	783 032

SECTION DESCRIPTION & COMMENTS:

3.7 m Gravelly Sand: Predominantly medium-grained sand with fine-grained gravel; clasts are subangular; the sample was taken from this unit.

2.1 m Sand and Gravel: Poorly sorted sand and gravel with some cobbles.

0.3 m Gravelly Sand: Gravelly fine-grained sand.

The reserve estimate pertains to the area outlined in Figure 5. About 19.5 million m^3 of these reserves lie below the water table.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		93.1	90.4	83.6	74.7	64.3	52.6	23.7	3.8	1.0	0.5

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 4%	Sound Lithotypes 96%
sandstone 2; shale 2	quartzite 39; felsic intrusive 33; felsic and mafic extrusive 24

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
450	280	13.5	37.8 million
	120	3.5	4.2 million

LOCATION:	G2-29 (65)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Road cut	**PARISH:**	Pennfield
STATUS:	Undeveloped	**UTM:**	798 049

SECTION DESCRIPTION & COMMENTS:

0.8 m Soil: Developed on the underlying material.

0.7 m Sand and Gravel: Predominantly medium-grained sand and fine- and coarse-grained gravel with a few cobbles; clasts are subangular; Sample A was taken from this unit.

0.9 m Sand: Horizontally stratified, predominantly fine-grained sand; Sample B was taken from this unit.

The reserve estimate pertains to the area outlined in Figure 5.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A		89.8	78.3	69.8	63.1	57.8	50.6	20.5	1.7	0.7	0.4
B				100.0	99.9	99.9	99.9	96.4	45.3	7.4	1.2

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 3%	Sound Lithotypes 97%
schist 3	quartzite 59; felsic intrusive 28; felsic and mafic extrusive 10

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
160	142	3.5	5.0 million

LOCATION:	G2-30 (22)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Pennfield
STATUS:	Inactive	**UTM:**	794 024

SECTION DESCRIPTION & COMMENTS:

0.3 m Soil: Silty soil, developed on the underlying material.

2.5 m Gravelly Sand: Predominantly fine-grained sand with fine-grained gravel; also contains some coarse-grained gravel and cobbles; Sample A was taken from this unit.

1.2 m Slump Covered: Assumed to be sand and gravel.

A test pit and auger hole in the base of the pit penetrated 1.8 m of predominantly fine-grained sand with interstratified layers of silt. The water table was encountered at a depth of 1.5 m. Sample B was taken from this unit.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A		97.0	96.1	89.5	77.9	63.0	47.5	20.4	3.1	0.5	0.2
B				100.0	99.6	99.2	98.8	97.7	89.7	62.7	25.4

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
			See G2-28

LOCATION:	G2-31 (116)	NTS:	21 G/2
TYPE OF DEPOSIT:	Ice-contact	COUNTY:	Charlotte
EXPOSURE TYPE:	Road cut	PARISH:	Pennfield
STATUS:	Undeveloped	UTM:	812 038

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed on the underlying material.

1.4 m Sand and Gravel: Fine- to medium-grained sand and fine- to coarse-grained gravel, with some cobbles and a few boulders; contains some silty pockets; clasts are predominantly subangular and partially silt coated.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	92.1	80.5	76.9	66.9	59.6	54.6	50.5	38.7	22.2	10.2	4.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 3%	Sound Lithotypes 97%
sandstone 1; shale 1; weathered 1	felsic and mafic extrusive 65; felsic intrusive 24; quartzite 8

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
72	18	6.5	1.2 million
	42	2.5	1.1 million

LOCATION:	G2-32 (23)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Pennfield
STATUS:	Inactive	**UTM:**	804 027

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil, developed on the underlying material.

2.6 m Sand and Gravel: Medium- to coarse-grained sand and fine-grained gravel, with a few cobbles; clasts are subrounded to rounded; Sample A was taken from this unit.

1.5 m Gravelly Sand: Material similar to the above, but sandier; Sample B was taken from this unit.

1.5 m Sand and Gravel: Medium- to coarse-grained sand and fine- to coarse-grained gravel, with numerous cobbles; Sample C was taken from this unit.

0.9 m Sand: Stratified, predominantly fine-grained sand, with some silty layers; Sample D was taken from this unit.

2.8 m Slump Covered: Assumed to be sand or gravel.

The upper 6.1 m appears to be a single depositional unit. It is poorly stratified. Clasts are predominantly subrounded, and most are silt-coated.

Reserves are estimated for that area outlined in Figure 6.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass	A	99.5	92.4	74.6	52.0	29.7	13.5	3.6	1.8	1.1	0.7
	B	89.2	85.3	78.8	68.3	50.0	26.7	5.0	1.3	0.5	0.2
	C	77.6	70.7	54.1	39.2	25.9	14.1	4.0	1.6	0.7	0.3
	D						100.0	97.3	64.1	20.8	5.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 17%	Sound Lithotypes 83%
schist 10; shale 5; sandstone 1; chert 1	felsic and mafic intrusive 37; quartz and quartzite 31; felsic and mafic extrusive 15

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
100	80	9	7.2 million

LOCATION:	G2-33 (28)	NTS:	21 G/2
TYPE OF DEPOSIT:	Ice-contact	COUNTY:	Charlotte
EXPOSURE TYPE:	Test pit	PARISH:	Pennfield
STATUS:	Undeveloped	UTM:	795 018

SECTION DESCRIPTION & COMMENTS:

0.2 m Topsoil

0.6 m Sandy Gravel: Very poorly sorted sand and gravel with numerous cobbles; clasts are subangular; many of the larger clasts are silt-coated.

The reserve estimate pertains to that area outlined in Figure 6.

(Examination of the orthophoto maps for this area indicates that this extremely kettled deposit has remnants of a flat, gently sloping surface. This may be a very early delta that was deposited during a period of rapid sedimentation and ice calving. A disputed radiocarbon date of 16 500 yBP from Little Lake, in the middle of the deposit (Gadd 1973; Mott 1975), provides a maximum age for the deposit. A.S.)

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	93.2	71.3	61.0	43.9	31.4	24.1	19.0	11.1	5.7	3.6	2.5

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 23%	Sound Lithotypes 77%
shale 16; sandstone 5; schist 2	quartz and quartzite 36; felsic and mafic intrusive 24; felsic and mafic extrusive 17

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
440	405	3.5	14.2 million

LOCATION:	G2-34 (45)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Pennfield
STATUS:	Inactive	**UTM:**	762 978

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed on the underlying material.

1.8 m Sand and Gravel: Medium- to coarse-grained sand and fine- to coarse-grained gravel, with numerous large cobbles and small boulders; clasts are partially silt coated; Sample A was taken from this unit.

0.9 m Cobbly Gravel: Openwork coarse-grained gravel and small cobbles.

1.5 m Sand and Gravel: Medium- and coarse-grained sand and fine- to coarse-grained gravel; clasts are subangular; contains numerous shale or schist clasts; Sample B was taken from this unit.

7.4 m Slump Covered: Assumed to be sand and gravel.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A	90.6	79.6	75.6	63.2	44.5	26.1	15.0	5.7	3.1	2.0	1.4
B		82.7	79.7	73.3	56.7	37.8	23.6	9.2	4.3	2.5	1.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 37%	Sound Lithotypes 63%
schist 30; sandstone 6; argillite 1	quartz and quartzite 44; felsic and mafic intrusive 11; felsic and mafic extrusive 8

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
15	14	10	1.4 million

LOCATION:	G2-35 (38)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Pennfield
STATUS:	Active-on-demand	**UTM:**	774 977

SECTION DESCRIPTION & COMMENTS:

11.6 m Sand and Gravel: Poorly sorted, cobbly sand and gravel, with a few boulders up to 0.5 m in size; exhibits cross-bedding and cut-and-fill structures; Sample A was taken from this unit.

0.6 m Sand: Fine-grained sand with some silty layers; stratification is contorted; appears disconformable with the lower unit.

1.5 m Gravelly Sand: Fine- to medium-grained sand with fine-grained gravel; the gravel is imbricated in places; Sample B was taken from this unit.

1.2 m Slump Covered: Assumed to be sand and gravel.

Reserves were estimated for the area outlined in Figure 6.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	A	96.0	92.8	85.5	77.5	67.6	59.5	40.0	20.0	6.0	1.5
	B	97.5	94.3	88.9	82.8	76.2	68.4	41.6	11.7	2.1	0.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 9%	Sound Lithotypes 91%
sandstone 5; shale 2; schist 2	felsic and mafic extrusive 79; felsic intrusive 7; quartzite 5

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
215	120 40	15.5 8	18.6 million 3.2 million

LOCATION:	G2-36 (42)	NTS:	21 G/2
TYPE OF DEPOSIT:	Marine/Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Pennfield
STATUS:	Active-on-demand	UTM:	768 966

SECTION DESCRIPTION & COMMENTS:

0.9 m Soil: Silty soil, developed in a sand and gravel unit.

1.2 m Sandy Gravel: Horizontally stratified fine- to coarse-grained gravel with medium- to coarse-grained sand and some cobbles; clasts are subangular to subrounded; Sample A was taken from this unit.

5.8 m Sand and Gravel: Southwestward-dipping beds of medium- and coarse-grained sand and fine- and coarse-grained gravel; clasts are subangular to subrounded, and imbricated; Sample B was taken from this unit.

(This site lies to the west of a wave-cut scarp. Its surface is a wave-truncated plain, cut to the level of the Utopia delta to the north. The upper unit above is of marine origin, derived from reworking of the pre-existing delta sediments. The lower unit is the erosional remnant of the Pennfield delta foreset beds. The underlying silty sand bottomset beds are now exposed locally at the base of the pit. A.S.)

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	A	76.3	71.7	47.1	31.7	23.7	17.9	9.6	2.9	1.2	0.8
	B	89.0	87.8	77.5	65.8	52.6	40.8	21.6	8.5	1.6	0.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 8%	Sound Lithotypes 92%
sandstone 3; schist 3; shale 2	felsic and mafic extrusive 82; quartz and quartzite 8; felsic and mafic intrusive 2

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
			See G2-35

LOCATION:	G2-37 (13, 14)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Pennfield
STATUS:	Active-on-demand	UTM:	792 979

SECTION DESCRIPTION & COMMENTS:

Composite Section

1.2 m Soil: Silty soil, developed in a poorly sorted sand and gravel.

2.2 m Sand and Gravel: Predominantly medium-grained sand and fine- to coarse-grained gravel with a few cobbles up to 13 cm in size; Sample A was taken from this unit.

1.2 m Sand and Gravel: Predominantly medium-grained sand and fine- to coarse-grained gravel, with some cobbles; numerous shale or schist clasts are present; Sample B was taken from this unit.

1.5 m Sand and Gravel: Predominantly medium-grained sand and fine-grained gravel, with a few cobbles; Sample C was taken from this unit.

1.8 m Sand and Gravel: Predominantly medium- and coarse-grained sand and fine-grained gravel, with a few gravel beds about 5 cm thick; Sample D was taken from this unit.

6.1 m Slump Covered: Assumed to be sand and gravel; the water table was at the base of the pit.

The clasts in this section are predominantly subrounded. The units described are not necessarily separate entities. The area to which the reserve estimate pertains is outlined in Figure 6. Approximately 20 million m^3 of these reserves exist below the water table.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	A	94.8	87.7	68.9	55.1	44.8	33.8	15.6	5.3	1.2	0.4
	B	74.2	68.0	55.7	45.6	34.7	22.4	5.8	1.3	0.6	0.4
	C	97.2	96.2	89.0	80.3	68.0	50.9	20.2	7.0	3.5	2.2
	D	100.0	99.4	87.3	69.4	46.5	31.5	12.4	4.0	1.1	0.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 11%	Sound Lithotypes 89%
schist 9; sandstone 2	quartz and quartzite 45; felsic and mafic extrusive 26; felsic intrusive 18

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
255	160	20	32.0 million
	40	5.5	2.2 million

LOCATION:	G2-38 (19)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Pennfield
STATUS:	Inactive	UTM:	793 952

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil, developed on the underlying material.

0.6 m Sand: Fine-grained sand coarsening downward to medium-grained sand; the sample was taken from this unit.

0.15 m Gravel: Fine- to coarse-grained gravel.

0.15 m Sandy Silt: Fine gravelly and coarse sandy silt (lodgement till?).

This part of the outwash plain appears to have been reworked by marine waters.

The reserve estimate pertains to the area outlined in Figure 6.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.			100.0	98.3	96.3	92.9	85.6	57.5	20.5	5.3	1.2

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
300	240 30	11 3.5	26.4 million 1.1 million

LOCATION:	G2-39 (27)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Pennfield
STATUS:	Inactive	UTM:	808 999

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil, developed in a sand and gravel unit.

1.3 m Sandy Gravel: Fine- to coarse-grained gravel with medium and coarse-grained sand and numerous cobbles; clasts are predominantly subrounded, with some silt coatings.

The reserve estimate pertains to the area around and beneath the Pennfield air strip (see Figure 6). Approximately 9 million m^3 of the sand and gravel lie above the water table. Exploitation of these reserves would require destruction of the air strip.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	89.5	68.1	61.7	45.8	32.0	20.8	13.9	5.7	2.4	1.4	1.0

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 19%	Sound Lithotypes 81%
schist 9; shale 6; sandstone 4	quartz and quartzite 37; felsic and mafic extrusive 32; felsic intrusive 12

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
160	80	12.5	10.0 million
	80	7	5.6 million

LOCATION:	G2-40 (1)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Pennfield
STATUS:	Inactive	**UTM:**	825 981

SECTION DESCRIPTION & COMMENTS:

0.8 m Soil: Silty soil, developed on the underlying material.

1.7 m Sand and Gravel: Predominantly medium-grained sand and fine- to coarse-grained gravel; Sample A was taken from this unit.

1.8 m Sand: Predominantly fine-grained sand with a few pebbles; contains an abundance of shale or schist grains; Sample B was taken from this unit.

The water table is present at the base of the pit.

The reserve estimate is for the area outlined in Figure 6. Approximately 7 million m^3 of the reserves lie below the water table.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	A	95.4	89.6	77.9	65.8	51.3	37.6	12.4	1.7	0.4	0.1
	B		100.0	98.1	95.5	93.5	91.9	89.1	80.4	46.0	16.2

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 23%	Sound Lithotypes 77%
schist 18; shale 3; sandstone 2	quartzite 50; felsic and mafic extrusive 25; felsic intrusive 2

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
215	150	10	15.0 million
	24	4.5	1.1 million

LOCATION:	G2-41 (9, 10)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Pennfield
STATUS:	Inactive	**UTM:**	829 999

SECTION DESCRIPTION & COMMENTS:

0.9 m Soil: Silty soil, developed in a sand and gravel unit.

0.9 m Gravelly Sand: Horizontally stratified, predominantly medium-grained sand with fine- to coarse-grained gravel; Sample A was taken from this unit.

0.7 m Sand and Gravel: Poorly sorted sand and gravel; Sample B was taken from this unit.

0.9 m Slump Covered: Assumed to be sand and gravel.

Clasts are predominantly subangular. About 3.5 m of similar materials are exposed in the pit to the southwest. The depth to the water table in the pit areas is unknown. Reserves are estimated for the area outlined on Figure 6.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	A	94.5	91.6	83.6	74.5	63.5	49.7	21.5	6.0	2.0	1.1
	B	88.6	79.6	52.0	37.9	29.0	24.3	17.1	8.5	1.5	0.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 10%	Sound Lithotypes 90%
sandstone 6; schist 3; chert 1	felsic and mafic extrusive 40; felsic intrusive 29; quartz and quartzite 21

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
200	100	9	9.0 million
	80	3.5	2.8 million

LOCATION:	G2-42 (6, 7)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Pennfield
STATUS:	Inactive	UTM:	836 987

SECTION DESCRIPTION & COMMENTS:

0.3 m Soil:

1.5 m Sand and Gravel: Horizontally stratified, predominantly medium-grained sand and fine-grained gravel; clasts are subrounded to rounded; Sample A was taken from this unit.

2.8 m Sand and Gravel: Predominantly medium-grained sand and fine- to coarse-grained gravel; this unit is more gravelly than that above; Sample B was taken from this unit.

The water table is present at the base of the pit.

The pit to the west of this site (UTM 834 988) exposes 3 m of material similar in texture to the lower unit above. However, it contained 20% unsound lithotypes.

The reserve estimate is for that area outlined in Figure 6. Approximately 8 million m^3 of these reserves exist below the water table.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A		94.9	91.2	85.8	77.8	69.3	55.3	21.7	2.9	0.9	0.5
B		91.9	87.7	70.5	49.0	34.8	29.5	20.8	7.5	1.5	0.3

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 4%	Sound Lithotypes 96%
schist 3; sandstone 1	quartz and quartzite 56; felsic and mafic extrusive 26; felsic intrusive 14

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
160	80	13	10.4 million
	40	5.5	2.2 million

LOCATION:	G2-43 (3)	NTS:	21 G/2
TYPE OF DEPOSIT:	Marine/Ice-contact(?)	COUNTY:	Charlotte
EXPOSURE TYPE:	Shore bluff	PARISH:	Pennfield
STATUS:	Undeveloped	UTM:	845 947

SECTION DESCRIPTION & COMMENTS:

0.3 m Soil

0.6 m Sand and Gravel: Poorly sorted sand and gravel, with a few cobbles and small boulders.

1.1 m Sand and Silt: Interstratified layers of fine-grained sand and silt.

1.1 m Sand and Gravel: Predominantly medium-grained sand and fine- to coarse-grained gravel; Sample A was taken from this unit.

3.9 m Sand and Gravel: Poorly sorted sand and gravel; clasts are angular, and silt coated; Sample B was taken from this unit.

8.2 m Slump Covered: Assumed to be sand and gravel; 3 m of modern beach sands and gravels lie below this level.

The upper two units are probably of marine origin.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A		86.1	78.2	67.7	57.9	49.1	39.4	19.9	6.3	1.3	0.4
B	94.4	72.1	59.5	23.3	12.2	8.0	6.0	3.6	2.2	1.3	0.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 10%	Sound Lithotypes 90%
sandstone 8; schist and shale 1; chert 1	quartz and quartzite 47; felsic and mafic extrusive 24; felsic and mafic intrusive 19

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
80	8	9	720 000

LOCATION:	G2-44 (125)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Road cut	**PARISH:**	Pennfield
STATUS:	Undeveloped	**UTM:**	858 088

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed on the underlying material.

0.6 m Sand: Predominantly medium-grained sand with some fine-grained gravel.

0.9 m Slump Covered: Assumed to be sand and gravel; the water table was at the base of the exposure.

The presence of many small ponds in this deposit suggests that there may be a high water table throughout most of it. The deposit is estimated to be at least 2.5 m thick.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		96.1	96.1	92.2	83.0	67.3	45.2	10.6	1.6	0.9	0.6

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
70+	30	2.5	750 000

LOCATION:	G2-45 (54)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Pennfield
STATUS:	Active-on-demand	UTM:	853 045

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil, developed in a horizontally stratified gravelly sand.

1.8 m Sandy Gravel: Fine- to coarse-grained gravel, with predominantly medium sand and some cobbles; clasts are subrounded.

0.1 m Slump Covered: Assumed to be sand and gravel.

Reserves are estimated for the area outlined in Figure 7.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	83.0	55.4	50.7	39.6	33.2	28.5	24.1	10.4	2.8	1.3	0.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 16%	Sound Lithotypes 84%
sandstone 9; schist 5; shale 2	felsic intrusive 42; quartz and quartzite 31; felsic and mafic extrusive 11

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
700	200	7	14.0 million
	450	3.5	15.8 million

LOCATION:	G2-46 (95)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Test pit	**PARISH:**	Pennfield
STATUS:	Undeveloped	**UTM:**	850 014

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed on the underlying material.

0.6 m Sand and Gravel: Medium- and coarse-grained sand and fine-grained gravel; clasts are predominantly subrounded.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		94.7	90.9	80.3	60.6	41.3	31.8	17.6	3.5	0.7	0.5

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 18%	Sound Lithotypes 82%
sandstone 10; weathered felsic and mafic extrusive 8	felsic and mafic extrusive 44; felsic intrusive 19; quartzite 19

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
80	75	2.5	1.9 million

LOCATION:	G2-47 (119)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Pennfield
STATUS:	Active-on-demand	UTM:	877 064

SECTION DESCRIPTION & COMMENTS:

0.5 m Soil: Silty soil.

0.5 m Silty Sand and Gravel: Silty sand and horizontally imbricated gravel.

1.2 m Sand and Gravel: Medium- and coarse-grained sand and fine- to coarse-grained gravel, with numerous cobbles; clasts are predominantly subrounded; the sample was taken from this unit (it is not representative of the coarser fraction of the material).

1.5 m Slump Covered: Assumed to be sand and gravel.

The reserve estimate pertains to the area outlined in Figure 7.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		71.2	65.7	51.4	40.7	30.7	20.5	5.3	1.1	0.5	0.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 19%	Sound Lithotypes 81%
sandstone 11; schist 4; weathered 4	felsic and mafic intrusive 46; felsic and mafic extrusive 21; quartz and quartzite 10; miscellaneous 4

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
97	29	16.5	4.8 million
	59	3.5	2.1 million

LOCATION:	G2-48 (93)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Railway cut	PARISH:	Pennfield
STATUS:	Undeveloped	UTM:	874 047

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed on the underlying material.

0.6 m Sand and Gravel: Predominantly medium-grained sand and fine- to coarse-grained gravel, with some cobbles; clasts are subrounded.

1.2 m Slump Covered: Assumed to be sand and gravel.

A shallow test pit at the base of the section exposed cobbly sandy gravel.

The reserve estimate is for the area outlined in Figure 7.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	95.6	79.3	72.1	61.9	51.9	43.8	33.1	14.6	3.8	0.9	0.5

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 15%	Sound Lithotypes 85%
sandstone 8; shale 4; weathered 3	felsic and mafic extrusive 59; felsic and mafic intrusive 18; quartzite 8

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
94	80	5.5	4.4 million

LOCATION:	G2-49 (139)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	River cut	PARISH:	Pennfield
STATUS:	Undeveloped	UTM:	878 033

SECTION DESCRIPTION & COMMENTS:

0.9 m Soil: Silty soil, developed in a sand and gravel unit.

2.4 m Gravelly Sand: Horizontally stratified fine- and medium-grained sand with fine-grained gravel; the lower 1.4 m is cobbly; Sample A was taken from this unit.

3.4 m Sand: Subhorizontally stratified and cross-bedded, predominantly medium-grained sand, with a few pebbles; this unit appears unconformable with the overlying unit; Sample B was taken from this unit.

2.4 m Gravelly Sand: Predominantly medium-grained sand, with fine-grained gravel; the contact below this unit appears to be abrupt; Sample C was taken from this unit.

2.6 m Silty Sand: Horizontally stratified, silty fine-grained sand; Sample D was taken from this unit.

1.6 m Slump Covered: Assumed to be sand or gravel.

A shallow test pit at the base of the section exposed horizontally stratified fine- to medium-grained sand with a few silty layers. Clasts throughout the section are subrounded to rounded.

The reserve estimate pertains to that area outlined on Figure 7.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass	A	95.6	94.1	85.7	75.5	62.2	49.2	15.2	1.7	0.4	0.2
	B			100.0	99.6	99.1	98.2	84.1	36.6	8.6	1.7
	C	96.0	93.5	88.8	82.7	74.6	62.4	30.9	5.5	0.3	0.1
	D						100.0	99.5	87.0	46.9	14.2

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 5%	Sound Lithotypes 95%
sandstone 5	felsic intrusive 47; felsic and mafic extrusive 36; quartzite 12

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
255	180	14+	25.2 million
	60	4.5(?)	2.7 million

LOCATION:	G2-50 (90)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Test pit	PARISH:	Lepreau
STATUS:	Undeveloped	UTM:	897 052

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil; developed on the underlying material.

0.3 m Sandy Gravel: Fine- to coarse-grained gravel, with predominantly medium-grained sand and numerous cobbles; clasts are subrounded to rounded.

The low percentage of sand is anomalous, since the sample size was too small to accurately account for the large clasts included in the sample.

The reserve estimate is for the area outlined on Figure 7.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	83.1	51.0	43.1	31.0	24.4	20.3	15.3	6.2	1.9	1.2	1.0

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 13%	Sound Lithotypes 87%
sandstone and conglomerate 8; shale 2; weathered 2; chert 1	felsic and mafic intrusive 31; felsic and mafic extrusive 31; quartz and quartzite 25

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
345	285	12.5	35.6 million
	45	2.5	1.1 million

LOCATION:	G2-51 (115)	NTS:	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	COUNTY:	Charlotte
EXPOSURE TYPE:	Test pit	PARISH:	Lepreau
STATUS:	Undeveloped	UTM:	920 042

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed on the underlying material.

0.9 m Sand: Predominantly medium- and coarse-grained sand, with some fine-grained gravel; clasts are subrounded.

This part of the outwash plain is probably 15 to 23 m thick, as indicated by the height of the steep slopes that bound the eastern extremity of this deposit. The reserve estimate pertains to the area outlined on Figure 7.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.			100.0	97.4	88.8	77.1	67.4	42.8	12.9	2.8	1.5

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
130	130	23	29.9 million

LOCATION:	G2-52 (50)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Lepreau
STATUS:	Active-on-demand	**UTM:**	919 056

SECTION DESCRIPTION & COMMENTS:

0.3 m Soil

2.3 m Gravelly Sand: Horizontally stratified, locally cross-bedded, predominantly medium-grained sand with fine-grained gravel; some coarse-grained gravel and a few cobbles are locally present; clasts are subangular to subrounded; Samples A and B were taken from this unit.

A shallow test pit in the base of the pit exposed fine- and medium-grained sand with a few pebbles. Sample C was taken from this material. The water table is present at the base of the pit.

The reserve estimate is for the area outlined on Figure 7.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass	A	93.6	90.3	83.1	76.8	68.8	57.8	22.5	3.0	0.8	0.5
	B	98.1	93.8	85.4	74.4	63.0	50.0	17.8	1.5	0.2	0.1
	C		99.6	98.5	96.3	91.3	83.4	60.4	30.8	10.3	2.1

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 6%	Sound Lithotypes 94%
sandstone 4; schist 2	felsic intrusive 56; felsic and mafic extrusive 27; quartzite 11

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
113	117	5.5+	6.4 million

LOCATION:	G2-53 (102)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Glaciofluvial outwash	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Lepreau
STATUS:	Inactive	**UTM:**	927 083

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed on the underlying material.

0.4 m Sand and Gravel: Horizontally stratified, predominantly fine-grained sand and fine-grained gravel.

1.5 m Gravelly Sand: Predominantly medium-grained sand, with fine-grained gravel; clasts are subangular; the sample was taken from this unit.

1.5 m Slump Covered: Assumed to be sand and gravel.

Reserves are estimated for the area outlined in Figure 7.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.		95.6	92.8	87.6	79.5	68.4	57.3	33.2	13.0	5.2	1.6

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
655	640	3.5	22.4 million

LOCATION:	G2-54 (49)	NTS:	21 G/2
TYPE OF DEPOSIT:	Ice-contact(?)	COUNTY:	Charlotte
EXPOSURE TYPE:	Pit	PARISH:	Lepreau
STATUS:	Inactive	UTM:	956 045

SECTION DESCRIPTION & COMMENTS:

1.8 m Sand and Gravel: Horizontally stratified, predominantly medium-grained sand and fine- to coarse-grained gravel, with numerous cobbles and some boulders; Sample A was taken from this unit.

0.9 m Sand and Gravel: Predominantly medium-grained sand and fine- to coarse-grained gravel, with a few cobbles; Sample B was taken from this unit.

Clasts are subangular to subrounded. Bedrock is exposed at the base and in the centre face of the pit.

MECHANICAL ANALYSIS:

sieve	50mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass. A		90.6	86.5	73.5	61.6	49.2	38.6	20.4	9.5	4.5	2.4
B	81.1	75.9	73.1	66.0	57.4	47.8	39.3	24.6	11.8	3.2	0.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 10%	Sound Lithotypes 90%
sandstone 6; schist 4	felsic intrusive 50; quartz and quartzite 34; felsic and mafic extrusive 6

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
			Limited

LOCATION:	G2-55 (46)	NTS:	21 G/2
TYPE OF DEPOSIT:	Marine shallow-water	COUNTY:	Charlotte
EXPOSURE TYPE:	Road cut	PARISH:	Lepreau
STATUS:	Undeveloped	UTM:	934 020

SECTION DESCRIPTION & COMMENTS:

0.8 m Soil: Silty soil, developed on the underlying material.

0.6 m Sand: Predominantly medium-grained sand, with a few pebbles.

An auger hole at the base of the section passed through a further 0.6 m of similar material into 0.3 m of silty fine-grained sand.

Most of the deposit in this area is very shallow.

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.			100.0	98.8	96.6	92.1	84.4	51.0	12.3	2.7	1.0

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes	%	Sound Lithotypes	%

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
18	3	2.5	75 000

LOCATION:	G2-56 (98)	**NTS:**	21 G/2
TYPE OF DEPOSIT:	Marine/Ice-contact	**COUNTY:**	Charlotte
EXPOSURE TYPE:	Pit	**PARISH:**	Lepreau
STATUS:	Inactive	**UTM:**	949 006

SECTION DESCRIPTION & COMMENTS:

0.6 m Soil: Silty soil, developed in sand and gravelly sand of probable marine shallow-water origin.

5.2 m Sand and Gravel: Relatively compact, predominantly medium-grained sand and fine-grained gravel; very cobbly in places; clasts are subangular; both samples were taken from this unit. (A: 1.8 to 3.7 m below surface; B: 3.7 to 5.8 m below surface).

MECHANICAL ANALYSIS:

sieve		25mm	19mm	9.5mm	4.75mm	2.36mm	1.4mm	600um	300um	150um	75um
% pass.	A	94.4	87.7	74.1	57.9	41.4	25.9	9.7	4.1	1.0	0.3
	B	91.7	86.1	74.4	57.9	41.2	27.4	10.1	3.6	1.3	0.5

LITHOLOGIC ANALYSIS:

Unsound Lithotypes 18%	Sound Lithotypes 82%
weathered 11; schist 4; sandstone 3	felsic and mafic extrusive 63; felsic and mafic intrusive 14; quartzite 5

ESTIMATION OF RESERVES:

Total Deposit Area (hectares)	Area Workable (hectares)	Average Thickness (metres)	Recoverable Reserves (m^3) Probable
27	10	5.5	550 000

APPENDIX C

SUPPLEMENTARY OBSERVATIONS

G2-101 UTM 573 060

This small, abandoned pit has two lifts, each a maximum of 7.6 m high. At the surface on the west side of the pit the material consists of sandy fine to medium gravel. On the east side of the pit it is cobbly sandy gravel, with a few boulders up to 1 m in size. However, DOT (1968) test pitting revealed that most of the material in the deposit is sand.

Bedrock outcrops about 6 m west of the west face of the pit and within the face. It is part of a north-northwest-trending ridge.

The deposit, probably a segment of the Bocabec esker, is now nearing depletion.

G2-102 UTM 580 051

This inactive pit, in a half depleted esker bead, exposes up to 7.3 m of sand and gravel overlying bedrock. The material at the crest is a bouldery cobble gravel. The material is finer on the flanks: medium to coarse sand is locally present.

This deposit is a segment of the Bocabec esker (see also: G2-1, 101). A now sterilized segment, to the west of the Bocabec River and immediately adjacent to Highway 127, was tested by DOT (1969). Their test results, on 8 samples of sandy gravel were as follows:

Mechanical Analysis:
74.8 to 100% passing 50 mm (average 87.9%)
20.5 to 69.2% passing 4.75 mm (average 41.8%)
1.3 to 12.1% passing 75 um (average 3.1%)

Los Angeles Abrasion Loss: 22.2 to 25.4% (average 23.6%)

Recommended for use as borrow, with some borderline to good subbase material.

Road cut exposures in other segments of the esker system to the north also consist of sandy gravel, locally cobbly.

Remaining workable reserves in these esker segments are estimated at 100 000 m^3.

G2-103 UTM 589 053

This small, linear pit, active-on-demand, is developed in a cobbly and bouldery colluvium lying against a bedrock scarp. Reserves are limited.

G2-104 UTM 601 113

This road cut exposure in a shallow-water marine deposit comprises about 1 m of fine sand over 0.5 m of sandy gravel. Similar material is exposed along the road within the mapped limits of the deposit. However, the full extent of the deposit is unknown, and thus reserves are unknown. Similar deposits could be present elsewhere in the valley.

G2-105 UTM 630 094

This flooded and now abandoned quarry was the source of the Atlantic Black Granite (diorite) building stone. The site was quarried intermittently from 1932 (Department of Natural Resources 1978).

G2-106 UTM 623 056

This small, abandoned pit exposes approximately 3.5 m of sandy gravel, generally similar to that at G2-2. The inactive pit immediately to the west exposes 3 m of similar material.

This pit is developed in a major segment of the Digdeguash River esker. The esker is approximately 9 m high at this point. The esker extends as a discontinuous series of beads and ridges from the northwestern corner of the map area south-southeastward to the Bethel delta.

DOT (1983) obtained 9 samples from the ridge to the north of Burns Brook and south of the Digdeguash River. The results of their tests on these samples, five of fine aggregate and four of coarse, were as follows:

Pit Run Material
Mechanical Analysis: - fine aggregate
86 to 99% passing 4.75 mm (average 93%)
1.4 to 5.5% passing 75 um (average 3.1%)

- coarse aggregate
67 to 96% passing 50 mm (average 85%)
21 to 57% passing 4.75 mm (average 41%)
1.7 to 2.6% passing 75 um (average 2.1%)

Los Angeles Abrasion Loss: 18.9%

Crushed Material (one sample)
Mechanical Analysis
50% passing 4.75 mm; 2.3% passing 75 um

Absorption: stone 0.83%; sand, 1.44%
Sand Equivalent: 85

The fine aggregate was recommended for use as borrow; the coarse aggregate for borrow, subbase, and base usage.

A similar range of materials is exposed by road cuts in this ridge.

The workable reserves in the esker deposits from the Digdeguash River south to this site (G2-105) are estimated at 750 000 m^3. Each of the five known segments to the northwest contains in the order of 100 000 m^3, for an additional 500 000 m^3. Similar segments could be buried or partially buried by marine sediments in the Digdeguash River valley in this area.

G2-107 UTM 626 031

This inactive pit in the Bethel delta, 11.6 m deep, exposes about 1 m of topset beds over westward-dipping foreset beds. The topset beds consist of slightly cobbly sandy medium to very coarse gravel. The foreset beds consist of sandy fine to medium gravel with some gravelly sand beds.

The ditch along Highway 1 exposes a further 2 m of material below the base of the pit.

G2-108 UTM 627 029

This large pit complex in the Bethel delta is 3 to 10 m deep. Most of the pit faces are slump covered, but stockpiles of screened and crushed material are still being used. The material exposed consists of cobbly sand gravel topset beds. However, DOT (1967, 1979) test logs suggest that finer material may underlie this, at depths generally greater than 4 m.

This area to the south of Highway 1 has been intensively test pitted by DOT (1967, 1979). A total of 25 samples were collected. The test results from these samples were as follows:

Mechanical Analysis:
52 to 95% passing 50 mm (average 79%)
13 to 54% passing 4.75 mm (average 36%)
1.4 to 13.7% passing 75 um (average 3.1%)

Los Angeles Abrasion Loss: 15.6 to 20.3% (average 17.6%)

Recommended for use as borrow, subbase, and base course material, and surface treatment chips.

G2-109 UTM 650 087

This small, active-on-demand pit exposes approximately 2 m of dense sandy ablation till with numerous boulders, overlying 0.5 m of weathered granite. Similar material may be present elsewhere in the area. Reserves in this deposit are limited.

G2-110 UTM 651 125

This small roadside pit exposes up to 4.4 m of esker sediments. The material is a "granitic" gravelly sand. It consists of coarse to very coarse sand with a gravel component ranging from very fine gravel to small boulders. Locally, the material is a sandy gravel, of similar grain size.

G2-111 UTM 682 116

This small, abandoned pit exposes approximately 4 m of fine to coarse sand with a few pebbles. A few large erratic boulders are present in the pit area.

G2-112 UTM 682 089

This inactive quarry is the source of the Canada Pink Granite building stone. This stone is of excellent quality, and has been extensively used (Department of Natural Resources 1978).

G2-113 UTM 710 114

This small pit, about 3.5 m deep over bedrock, is developed in an area of undulating ice-contact topography. The material exposed in the deposit includes both ice-contact stratified drift and ablation till. It varies from well-worked, bedded sand through poorly sorted sand gravel to silty sandy angular gravel with numerous boulders.

The material in the pit area is primarily sand. DOT (1980) obtained 4 samples from this site. The results of their analyses were as follows:

Mechanical Analysis:
72 to 99% passing 4.75 mm (average 86%)
0.4 to 8.3% passing 75 um (average 3.6%)

Los Angeles Abrasion Loss: 33.4%

Recommended for use as borrow and winter sand.

Workable reserves in the deposit are estimated to be in the order of 500 000 m^3. However, the deposit may be of considerably greater extent to the north than as mapped. Thus, reserves may be significantly greater.

G2-114 (84) UTM 675 033

A test pit dug at this site exposed 0.6 m of poorly sorted gravelly sand. Clasts are subrounded, and silt-coated. A sample from this site had 73.2% passing 4.75 mm and 1.0% passing 75 um.

G2-115 (81) UTM 678 010

This inactive pit contains an abundance of coarse gravel and cobbles. Felsic extrusive clasts comprise the dominant pebble lithology.

Bedrock is exposed in many places in this pit, suggesting that this part of the deposit is nearly depleted.

G2-116 (78) UTM 699 986

A house excavation at this site exposed 1.8 m of fine- and coarse-grained gravel. The material displayed faint horizontal stratification. Clasts, primarily felsic and mafic extrusives, quartz and quartzite, are subrounded and silt-coated; 7% are unsound. A sample from this site had 11.3% passing 4.75 mm and 0.6% passing 75 um.

Workable reserves in this deposit are estimated at 90 000 m^3.

G2-117 (77) UTM 701 987

A road cut exposure at this site displays 0.8 m of horizontally stratified, predominantly fine-grained sand. A sample from this site had 100% passing 4.75 mm and 5.4% passing 75 um.

This material may be ice-contact stratified drift, or shallow-water marine material reworked from the ice-contact deposit.

G2-118 (80) UTM 714 995

This inactive pit in the St. George moraine exposed the following section:

1.5 m Sand: Gravelly medium-grained sand.

2.1 m Slump Covered: Assumed to be sand and gravel.

1.8 m Sand and Gravel: Predominantly medium-grained sand and fine- and coarse-grained gravel; clasts are subangular; a sample from this unit had 58.3% passing 4.75 mm and 0.6% passing 75 um.

6.7 m Slump Covered: Assumed to be sand and gravel.

A test pit at the base of the section exposed medium-grained sand with a few pebbles. A sample of this material had 96.9% passing 4.75 mm and 0.4% passing 75 um.

Clasts in this pit are predominantly felsic and mafic extrusive, with lesser quartzite and felsic intrusives; 3% are unsound.

This part of the moraine has been effectively sterilized by urban development.

G2-119 (69) UTM 712 987

This inactive pit in the St. George moraine is 23.6 m deep. The section exposed was as follows:

0.8 m Soil: Silty soil, developed in a sandy gravel.

6.4 m Sand, Silt and Clay: Interstratified layers ranging from fine-grained sand to silty clay; the laminae are locally contorted and faulted; this unit is of marine origin.

2.4 m Sand: Fine-grained sand with a few pebbles.

0.9 m Slump Covered: Assumed to be sand and gravel.

4.0 m Sand and Gravel: Medium- to coarse-grained sand and fine- to coarse-grained gravel; clasts are subangular to subrounded.

9.1 m Slump Covered: Assumed to be sand and gravel.

Two samples from the sand and gravel unit had the following characteristics: 35.3 and 66.2% passing 4.75 mm, and 0.4 and 0.5% passing 75 um. The clasts are predominantly felsic and mafic extrusives; 9% are unsound.

G2-120 (72) UTM 645 938

This inactive quarry is developed in a weathered, severely deformed rhyolite. Evidence of low-grade metamorphism is present.

Pre-existing sand and gravel may have been removed to expose the weathered bedrock surface.

G2-121 UTM 621 866

This small, abandoned pit is 1 to 1.5 m deep over bedrock. The bedrock was striated by southeastward flowing ice.

The material at the site consists of poor quality sandy gravel overlying till. The bedrock is slaty, and has been quarried in the northern part of the pit.

G2-122 (73) UTM 668 913

Felsic volcanic rock was quarried from this site for use as fill for the construction of a nearby wharf.

G2-123 (120) UTM 754 126

This road cut site exposes 1.2 m of horizontally stratified fine- and medium-grained sand with a few subrounded pebbles. A sample from this site had 94.8% passing 4.75 mm and 1.4% passing 75 um.

G2-124 (132) UTM 764 124

This active-on-demand pit is 6.1 m deep. It exposes predominantly gravelly sand, consisting of medium-grained sand with subangular fine-grained gravel. A sample from this site had 78.6% passing 4.75 mm and 0.6% passing 75 um.

G2-125 (130) UTM 770 118

The following section was observed in this inactive pit.

0.6 m Soil: Silty soil, developed in a sand and gravel unit, with some cobbles.

0.9 m Silt and Sand: Horizontally stratified, fine-grained sand and silt.

0.9+ m Sand and Gravel: Poorly sorted sand, gravel and cobbles, with some small boulders; clasts are partially silt-coated.

The lower unit may be an ablation till.

G2-126 (36) UTM 759 027

This site is a railway cut in a probable shallow-water marine deposit. The following section was observed:

0.5 m Soil: Silty soil, developed on the underlying material.

0.2 m Silty Sandy Gravel: Fine- to coarse-grained gravel in a sandy silt to silty sand matrix.

0.9 m Sand: Fine- to medium-grained sand with a few pebbles; a sample of this material had 97.6% passing 4.75 mm and 0.6% passing 75 um.

Most of this deposit is sterilized by industrial development. Remaining workable reserves are estimated at 220 000 m^3.

G2-127 (37) UTM 748 019

This active-on-demand pit in the St. George moraine exposes 0.6 m of poorly sorted cobbly sand and gravel overlying 4 m of fine- and medium-grained sand with a few pebbles. A sample from the lower unit had 94.4% passing 4.75 mm and 2.0% passing 75 um. This unit displayed southward-dipping, contorted stratification.

The pit is 5.8 m deep. Reserves in the pit area are estimated at about 120 000 m^3.

G2-128 (59) UTM 747 015

This inactive pit in the St. George moraine exposes 2.4 m of predominantly medium-grained sand with some fine-grained gravel. A sample of this material had 83.5% passing 4.75 mm and 2.6% passing 75 um.

This pit displays classical ice-contact material. Boulders up to 1.8 m in size were observed. Flow till is present at the south end of the pit.

Workable reserves in the pit area are estimated at 130 000 m^3.

G2-129 (31) UTM 764 019

This pit, active-on-demand, exposes 1.5 m of poorly sorted cobbly sand and gravel topset beds, overlying cross-bedded sand and gravel foreset beds. The lower unit consists predominantly of medium-grained sand and fine-grained gravel, with some cobbles; clasts are

subangular. A sample from this unit had 65.1% passing 4.75 mm and 0.3% passing 75 um. Eleven per cent of the clasts are unsound.

The pit is 6.1 m deep.

G2-130 (58) UTM 791 053

This pit, active-on-demand, exposes 3.4 m of sand above the water table. The upper 1.5 m consists predominantly of medium-grained sand with a trace of fine-grained gravel. The remainder of the section consists of horizontally stratified fine-grained sand with some silt. A sample from the upper unit had 96.3% passing 4.75 mm and 0.3% passing 75 um.

G2-131 (64) UTM 804 043

This inactive pit exposes 1.8 m of predominantly fine-grained sand. A sample of this material had 100% passing 4.75 mm and 0.2% passing 75 um. Estimated reserves for this part of the Utopia delta (see Figure 5) are 4 million m^3.

G2-132 (62) UTM 801 038

This small, inactive pit exposes 1.5 m of fine-grained sand with a few pebbles over 0.5 m of horizontally stratified medium-grained sand. A sample from this section had 96.7% passing 4.75 mm and 3.5% passing 75 um.

G2-133 (60) UTM 793 034

A test pit at this site exposed 0.9 m of predominantly fine-grained gravel with medium- to coarse-grained sand. The clasts are subrounded and partially silt-coated; 7% are unsound. A sample from this site had 31.7% passing 4.75 mm and 0.3% passing 75 um.

G2-134 (61) UTM 799 032

This inactive pit exposes 1.8 m of horizontally stratified fine- to medium-grained sand with a few pebbles. A sample from the section had 99.2% passing 4.75 mm and 0.6 % passing 75 um.

G2-135 (57) UTM 784 010

This pit, active-on-demand, exposes 7.6 m of sand. The upper 2.1 m is primarily cross-bedded, gravelly medium sand. A sample of this material had 85.7% passing 4.75 mm and 0.3% passing 75 um. The remainder of the material is horizontally stratified, slightly silty fine-grained sand. A sample from this unit had 100% passing 4.75 mm and 7.9% passing 75 um.

G2-136 (63) UTM 807 041

This inactive pit exposes 3.7 m of predominantly medium- to coarse-grained gravel, with some cobbles and a few boulders up to 0.6 m in size. A thin pebbly silt layer is present 1 to 2 m below the surface. The clasts in the deposit are subangular; 12% are unsound. A sample of the material (not fully representative of the coarser fraction) had 52.5% passing 4.75 mm and 0.4% passing 75 um.

The extent of this deposit is unknown. Recoverable reserves are estimated at 350 000 m^3.

G2-137 (117) UTM 812 033

This 1.8 m high road cut section exposes fine- to medium-grained sand with some fine- to coarse-grained gravel, and a few cobbles and small boulders. The clasts are subangular to subrounded. A sample of the material had 85.8% passing 4.75 mm and 6.6% passing 75 um.

G2-138 (33) UTM 812 028

A 1.7 m high road cut section at this site exposes poorly sorted sand and gravel with numerous cobbles. The clasts are predominantly subangular; 6% are unsound. A sample of the material had 85.4% passing 50 mm, 34.5% passing 4.75 mm, and 2.6% passing 75 um.

G2-139 (25) UTM 778 994

This inactive pit, 2.7 m deep, exposes predominantly poorly sorted sand and gravel, with a few cobbles. The clasts are subrounded to rounded; 9% are unsound. A sample of this material had 52.5% passing 4.75 mm and 0.8% passing 75 um.

An 0.6 m deep auger hole in the base of the pit exposed fine-grained sand and silt. A sample of this material had 100% passing 4.75 mm and 37.7% passing 75 um.

Reserves in this part of the Pennfield delta (see Figure 6) are estimated at about 1.5 million m^3.

G2-140 (24) UTM 774 985

This 2.1 m high road cut exposes predominantly medium- to coarse-grained sand and fine- to coarse-grained gravel. Boulders up to 1.2 m in size are present. The clasts are subrounded; 10% are unsound. A sample of this material had 92.1% passing 50 mm, 53.2% passing 4.75 mm and 0.3% passing 75 um.

G2-141 (39) UTM 773 980

The following section was observed in this active pit:

1.5 m Sandy Gravel: Predominantly fine-grained gravel with fine- and medium-grained sand; locally very silty.

4.6 m Sand and Gravel: Predominantly fine-grained gravel and medium- to coarse-grained sand, locally cobbly; clasts are subangular, and 6% are unsound; a sample of this material had 42.8% passing 4.75 mm and 0.6% passing 75 um.

1.5 m Slump covered: Assumed to be sand and gravel.

Recoverable reserves in this part of the Pennfield delta (see Figure 6) are estimated at 1.9 million m^3.

G2-142 (41) UTM 773 969

This active-on-demand pit exposes 3.7 m of horizontally stratified, poorly sorted sand and gravel with some cobbles and a few boulders up to 0.8 m in size, overlying 9.1 m of subhorizontally stratified, predominantly fine-grained gravel and medium- to coarse-grained sand. A sample from the lower unit had 59.8% passing 4.75 mm and 0.5% passing 75 um. The clasts are subangular; 20% are unsound.

G2-143 (43) UTM 770 967

This inactive pit exposes the following section:

0.9 m Soil: Silty soil, developed on the underlying material.

1.5 m Sand and Gravel: Poorly sorted sand and gravel.

1.8 m Sandy Gravel: Fine- to coarse-grained gravel with predominantly medium-grained sand and numerous cobbles; a sample of this material had 32.7% passing 4.75 mm and 0.9% passing 75 um.

1.5 m Sand and Gravel: Medium- and coarse-grained sand and fine-grained gravel; a sample of this material had 65.9% passing 4.75 mm and 0.7% passing 75 um.

13.4 m Slump Covered: Assumed to be sand and gravel.

The clasts in this pit are angular; 29% are unsound.

G2-144 (40) UTM 766 962

This inactive pit exposes 7.9 m of sand and gravel. The material is primarily medium- to coarse-grained sand and fine-grained gravel. A sample had 55.6% passing 4.75 mm and 0.6% passing 75 um. The clasts are predominantly subangular; 10% are unsound.

A test pit in the base of the pit exposed 0.6 m of gravelly fine- and medium-grained sand. A sample of this material had 76.7% passing 4.75 mm and 3.0% passing 75 um. The clasts were subrounded.

G2-145 (21) UTM 777 969

This inactive pit, 11.6 m deep, exposes a 3.0 m thick topset unit of horizontally stratified, poorly sorted, cobbly sand and gravel, overlying a foreset unit of cross-bedded, gravelly fine- to coarse-grained sand. A sample from the talus slope had 80.1% passing 4.75 mm and 0.6% passing 75 um. The clasts in the upper unit are more rounded than those in the lower; 16% are unsound.

G2-146 (15) UTM 784 979

This active pit, 5.9 m deep, exposes 3.8 m of cross-bedded, predominantly medium-grained sand and fine-grained gravel. A sample of the material had 50.7% passing 4.75 mm and 0.6% passing 75 um. The clasts are predominantly subangular; 13% are unsound.

G2-147 (16) UTM 789 983

This active-on-demand pit exposes 7.0 m of cobbly sandy predominantly coarse-grained gravel. A sample of this material had 31.9% passing 4.75 mm and 0.7% passing 75 um. An 0.3 m thick lens of cross-bedded sand is present near the middle of the section. Maximum clast size in the pit is 0.3 m. Twenty-two per cent of the clasts are unsound.

The water table is present at the base of the pit.

G2-148 (26) UTM 804 006

An 0.8 m deep test pit at this site exposed predominantly fine-grained gravel with coarse-grained sand and some coarse-grained gravel and small cobbles. The clasts are subangular to subrounded, and silt-coated; 11% are unsound. A sample of this material had 19% passing 4.75 mm and 1.6% passing 75 um.

Reserves for this part of the Pennfield delta (see Figure 6) are estimated at 27 million m^3.

G2-149 (17) UTM 804 980

A 5.5 m high section in this inactive pit exposes 2.4 m of predominantly medium- to coarse-grained sand and fine- to coarse-grained gravel with some cobbles, overlying horizontally stratified, gravelly medium-grained sand. A sample from the upper unit had 46.9% passing 4.75 mm and 0.5% passing 75 um. One from the lower unit had 86.9% passing 4.75 mm and 0.3% passing 75 um. The clasts in the section are subrounded to rounded; 28% are unsound.

The water table lies at the base of the pit.

G2-150 (5) UTM 806 973

This inactive pit exposes 4.7 m of predominantly medium-grained sand and fine- to coarse-grained gravel, locally cobbly. A sample of this material had 73.4% passing 4.75 mm and 0.4% passing 75 um. The clasts are subangular to subrounded; 17% are unsound.

G2-151 (18) UTM 803 964

A test pit at this site exposed 0.9 m of medium- and coarse-grained sand and fine- to coarse grained gravel with some cobbles. A sample of this material had 45.4% passing 4.75 mm and 0.3% passing 75 um. The clasts are subrounded; 8% are unsound.

G2-152 (20) UTM 792 961

This inactive pit exposes 10.7 m of marine sand, silt and clay. The material is horizontally stratified, with individual layers ranging from fine-grained sand to clayey silt. A few pebbles, and some coarser sand layers, are also present.

Reserves are estimated at about 1.8 million m^3.

G2-153 (44) UTM 774 917

A house excavation at this site exposes 1.5 m of horizontally stratified medium- to coarse-grained sand and fine-grained gravel. The clasts are partially silt-coated. A sample of the material had 58.8% passing 4.75 mm and 1.1% passing 75 um. Reserves are about 50 000 m^3.

The bedrock quarry to the southeast of this site is developed in intermediate to mafic extrusive rocks.

G2-154 (11, 12) UTM 824 988

The northern face of this inactive pit exposes 3.8 m of sand and gravel. The upper 2.1 m is predominantly medium-grained sand and fine- to coarse-grained gravel. The material at the base of the section is a poorly sorted sand and gravel containing a high percentage of fine-grained gravel. A sample of the upper material had 50.0% passing 4.75 mm and 0.8% passing 75 um. One from the lower material had 34.5% passing 4.75 mm and 0.7% passing 75 um. The clasts in these units are predominantly subangular; 26% in the upper unit and 11% in the lower unit are unsound.

The southern face is 2.7 m high. It exposes medium-grained sand and predominantly fine-grained gravel, with a few cobbles. A sample of the material had 60.5% passing 4.75 mm and 1.6% passing 75 um. The clasts are predominantly subrounded; 21% are unsound.

Reserves for this part of the Pennfield delta (see Figure 6) are estimated at 13 million m^3. Of this amount, 9.3 million m^3 lies below the water table, which is present at the base of the pit.

G2-155 (8) UTM 829 993

This inactive pit exposes 3.5 m of poorly sorted sandy gravel with cobbles up to 0.2 m in diameter. A sample of this material had 70.6% passing 75 mm, 30.3% passing 4.75 mm, and 1.0% passing 75 um. The clasts are subrounded to rounded; 25% are unsound. The water table is present at the base of the pit.

G2-156 (4) UTM 848 953

The shore bluff at this site exposes 9.1 m of generally poorly sorted sand and gravel. The upper third is locally silty. A sample from the middle of the section had 46.9% passing 4.75 mm and 2.3% passing 75 um. A sample from the base of the section was slightly finer: 53.2% passing 4.75 mm and 1.4% passing 75 um; The clasts are subangular to subrounded; 8% are unsound.

This deposit may be a morainic feature.

G2-157 (126) UTM 857 090

This 1.5 m high road cut exposes predominantly gravelly medium-grained sand, that contains contorted stratified lenses of silty sand and gravel. A few cobbles and small boulders are present. The clasts are subrounded to rounded.

G2-158 (124) UTM 859 085

A road cut at this site exposes 1.2 m of gravelly sand outwash. The material consists of predominantly medium-grained sand with subrounded fine-grained gravel. A sample of the material had 76.2% passing 4.75 mm and 0.4% passing 75 um.

To the east of this site, a very cobbly and bouldery deposit of silty sand and gravel ablation till is present. This location marks the contact between the glaciofluvial outwash and the ablation till. The outwash deposit is very flat, and appears to be terraced.

G2-159 (55) UTM 850 039

This inactive pit exposes 2.4 m of predominantly medium-grained sand with some fine-grained gravel, predominantly subangular. A sample of this material had 88.2% passing 4.75 mm and 0.3% passing 75 um.

The water table is present at the base of the pit.

G2-160 (96) UTM 848 005

A test pit at this site exposed a thin veneer of outwash sand of variable thickness, overlying a relatively loose, silty stony sand ablation till with numerous boulders up to 0.9 m in diameter. A sample of the sand had 98.5% passing 4.75 mm and 0.2% passing 75 um.

Workable reserves are very limited.

G2-161 (53) UTM 877 059

This small, inactive pit exposes 1.2 m of poorly sorted cobbly sandy gravel, locally very silty, over 1.2 m of predominantly medium-grained sand and fine- to coarse-grained gravel with some cobbles. A sample from the lower unit had 93.2% passing 50 mm, 61.0% passing 4.75 mm, and 3.0% passing 75 um. The clasts are predominantly subangular, with the exception of the cobbles, which are well-rounded. Thirteen per cent of the clasts are unsound.

G2-162 (52) UTM 891 064

This road cut exposes 1.2 of predominantly medium-grained sand and fine-grained gravel. A sample of this material had 51.7% passing 4.75 mm and 0.4% passing 75 um. The clasts are subrounded; 13% are unsound.

Reserves in this part of the Pocologan River outwash deposit (see Figure 7) are estimated at 2.9 million m^3.

G2-163 (108) UTM 886 046

This road cut exposure consists of 1.5 m of stratified, predominantly coarse-grained sand and fine-grained gravel. A sample of this material had 48.6% passing 4.75 mm and 1.3% passing 75 um. The clasts are well-rounded; 21% are unsound.

Workable reserves for this part of the Pocologan River outwash deposit (see Figure 7) are estimated at 24.9 million m^3.

G2-164 (109) UTM 885 037

This 7.9 m high road cut exposes predominantly sand. An upper 1.5 m thick unit of predominantly medium-grained sand with some fine-grained gravel is separated from a lower unit of subhorizontally stratified, predominantly fine- to medium-grained sand, at least 3 m thick, by an 0.3 m thick bed of horizontally stratified fine-grained sand. A sample from the upper unit had 86.3% passing 4.75 mm and 0.4% passing 75 um, while one from the lower unit had respective values of 98.2% and 2.2%.

Reserves in this part of the Pocologan River outwash deposit (see Figure 7) are estimated at 27.7 million m^3.

G2-165 (89) UTM 909 049

A test pit at this site exposed 0.9 m of fine- and medium-grained sand overlying predominantly medium-grained sand and fine- to coarse-grained gravel with a few cobbles. A sample from the lower unit had 48.1% passing 4.75 mm and 0.2% passing 75 um. Eight per cent of the clasts are unsound.

G2-166 (107) UTM 915 053

A test pit at this site exposed 1.2 m of predominantly medium-grained sand and fine- to coarse-grained gravel with a few cobbles. A sample of this material had 59.8% passing 4.75 mm and 0.2% passing 75 um. The clasts are subrounded; 17% are unsound.

Reserves in this part of the Pocologan River outwash deposit (see Figure 7) are estimated at 2.2 million m^3.

G2-167 (88) UTM 919 060

This test pit site exposed 0.9 m of predominantly medium-grained sand and fine- to coarse-grained gravel. A sample of the material had 35.4% passing 4.75 mm and 0.7% passing 75 um. The clasts are subangular to subrounded, and are partially silt coated; 15% are unsound.

G2-168 (110) UTM 919 131

This road cut exposure consists of 6.1 m of ablation till. The material is a poorly sorted sand and gravel with some cobbles and boulders. A sample of the material, exclusive of the coarser fraction, had 44.4% passing 4.75 mm and 2.2% passing 75 um. The clasts are very angular, and are silt coated; 5% are unsound.

G2-169 (104) UTM 929 076

This 4.9 m high road cut exposes predominantly fine-grained sand with some coarse sandy layers. Minor faulting is evident.

The quantity of material in this area appears to be limited.

G2-170 (105) UTM 932 066

This small excavation exposes 1.1 m of silty sandy gravel. The material, probably ablation till, consists of poorly sorted sand and gravel, locally very silty, with a few cobbles. A sample of this material had 63.7 passing 4.75 mm and 2.6% passing 75 um. The clasts are angular to subangular, and are silt coated; 31% are unsound.

G2-171 (2) UTM 892 983

The shore bluff at this site exposes 3.0 m of cross-bedded fine- to coarse-grained sand over 1.8 m of interstratified fine-grained sand and clayey silt. The lower 0.9 m of the latter unit contains some thin organic horizons.

The lower unit is marine. The upper unit may be glaciofluvial outwash or marine. Workable reserves in this deposit are estimated to be about 340 000 m^3.

G2-172 (91) UTM 948 012

This inactive pit exposes 1.5 m of horizontally stratified fine-grained sand, with some medium-grained sand layers. The material becomes finer with depth. A sample of the material had 100% passing 4.75 mm and 1.5% passing 75 um.

An auger hole in the base of the pit penetrated 0.9 m of silty fine-grained sand. Clayey layers are locally present. In places, the material overlies till.

G2-173 (92) UTM 951 013

This inactive pit exposes 2.1 m of predominantly medium-grained sand and fine- to coarse-grained gravel, with numerous cobbles, overlying 0.3 m of very clean and well-sorted fine-grained sand. Ten per cent of the clasts are unsound. Some boulders are present at the north end of the pit.

This deposit is presumed to be of shallow-water marine origin. Reserves are estimated at approximately 550 000 m^3.

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